

SEQUENCE LISTING

<110> GONSALVES, DENNIS
LING, KAI-SHU

<120> GRAPEVINE LEAFROLL VIRUS PROTEINS AND
THEIR USES

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<140> US 10/039,112

<141> 2001-12-31

<150> US 09/650,324

<151> 2000-08-29

<150> US 09/579,259

<151> 2000-05-25

<150> US 09/224,898

<151> 1998-12-31

<150> US 08/770,544

<151> 1996-12-20

<150> US 60/009,008

<151> 1995-12-21

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<170> FastSEQ for Windows Version 4.0

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<213> Grapevine Leafroll Virus

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<213> Grapevine Leafroll Virus

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atgaagcagg tggaggagtt gatactcttg acacttggtg ttgatagaga agttttgtct 900
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tctgtcggct ctcagaggcg cagtgggtgt gctaacacgt ggttgggaaa tagtttagtc 1020
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ggatgagata gccttatatt tagtcggcag ccggttgata ttgatacgtc gggtctgagc 1140
gataattttg gttttgacgt aaagattttt aaccaagctg ctccatattt ttgttctaag 1200
tttttagttc aagtcgagga tagtctcttt tttgttcccg atccacttaa actcttcggt 1260
aagtttgagg ctccaaaaac ttcagatc gaccttttac atgagatttt tcaatctttc 1320
gtcgatcttt cgaaggggtt caatagagag gacgtcatcc aggaattagc taagctggtg 1380
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agtgcaaaatt tttcgcagtt ctgtagggtt tattaccaca atagcgtgaa tctcgatgtg 1500
cgccctattc agaggaccga gtcgctttcc ttgctggcct tgaaggcaag aattttaagg 1560
tggaaagctt ctcgttttgc cttttcgata aagaggggtt aa 1602

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<210> 4

<211> 533

<212> PRT

<213> Grapevine Leafroll Virus

<400> 4

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Met Asn Phe Gly Pro Thr Phe Glu Gly Glu Leu Val Arg Lys Ile Pro
1          5          10          15
Thr Ser His Phe Val Ala Val Asn Gly Phe Leu Glu Asp Leu Leu Asp
20        25        30
Gly Cys Pro Ala Phe Asp Tyr Asp Phe Phe Glu Asp Asp Phe Glu Thr
35        40        45
Ser Asp Gln Ser Phe Leu Ile Glu Asp Val Arg Ile Ser Glu Ser Phe
50        55        60
Ser His Phe Ala Ser Lys Ile Glu Asp Arg Phe Tyr Ser Phe Ile Arg
65        70        75        80
Ser Ser Val Gly Leu Pro Lys Arg Asn Thr Leu Lys Cys Asn Leu Val
85        90        95
Thr Phe Glu Asn Arg Asn Ser Asn Ala Asp Arg Gly Cys Asn Val Gly
100       105       110
Cys Asp Asp Ser Val Ala His Glu Leu Lys Glu Ile Phe Phe Glu Glu
115       120       125
Val Val Asn Lys Ala Arg Leu Ala Glu Val Thr Glu Ser His Leu Ser
130       135       140
Ser Asn Thr Met Leu Leu Ser Asp Trp Leu Asp Lys Arg Ala Pro Asn
145       150       155       160
Ala Tyr Lys Ser Leu Lys Arg Ala Leu Gly Ser Val Val Phe His Pro
165       170       175

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Ser	Met	Leu	Thr	Ser	Tyr	Thr	Leu	Met	Val	Lys	Ala	Asp	Val	Lys	Pro
			180					185					190		
Lys	Leu	Asp	Asn	Thr	Pro	Leu	Ser	Lys	Tyr	Val	Thr	Gly	Gln	Asn	Ile
		195					200					205			
Val	Tyr	His	Asp	Arg	Cys	Val	Thr	Ala	Leu	Phe	Ser	Cys	Ile	Phe	Thr
	210				215						220				
Ala	Cys	Val	Glu	Arg	Leu	Lys	Tyr	Val	Val	Asp	Glu	Arg	Trp	Leu	Phe
225					230					235					240
Tyr	His	Gly	Met	Asp	Thr	Ala	Glu	Leu	Ala	Ala	Leu	Arg	Asn	Asn	
			245						250				255		
Leu	Gly	Asp	Ile	Arg	Gln	Tyr	Tyr	Thr	Tyr	Glu	Leu	Asp	Ile	Ser	Lys
			260					265					270		
Tyr	Asp	Lys	Ser	Gln	Ser	Ala	Leu	Met	Lys	Gln	Val	Glu	Glu	Leu	Ile
		275					280						285		
Leu	Leu	Thr	Leu	Gly	Val	Asp	Arg	Glu	Val	Leu	Ser	Thr	Phe	Phe	Cys
	290					295					300				
Gly	Glu	Tyr	Asp	Ser	Val	Val	Arg	Thr	Met	Thr	Lys	Glu	Leu	Val	Leu
305					310					315					320
Ser	Val	Gly	Ser	Gln	Arg	Arg	Ser	Gly	Gly	Ala	Asn	Thr	Trp	Leu	Gly
				325					330					335	
Asn	Ser	Leu	Val	Leu	Cys	Thr	Leu	Leu	Ser	Val	Val	Leu	Arg	Gly	Leu
			340					345					350		
Asp	Tyr	Ser	Tyr	Ile	Val	Val	Ser	Gly	Asp	Asp	Ser	Leu	Ile	Phe	Ser
		355					360					365			
Arg	Gln	Pro	Leu	Asp	Ile	Asp	Thr	Ser	Val	Leu	Ser	Asp	Asn	Phe	Gly
	370					375					380				
Phe	Asp	Val	Lys	Ile	Phe	Asn	Gln	Ala	Ala	Pro	Tyr	Phe	Cys	Ser	Lys
385					390					395					400
Phe	Leu	Val	Gln	Val	Glu	Asp	Ser	Leu	Phe	Phe	Val	Pro	Asp	Pro	Leu
			405						410					415	
Lys	Leu	Phe	Val	Lys	Phe	Gly	Ala	Ser	Lys	Thr	Ser	Asp	Ile	Asp	Leu
			420					425					430		
Leu	His	Glu	Ile	Phe	Gln	Ser	Phe	Val	Asp	Leu	Ser	Lys	Gly	Phe	Asn
		435					440					445			
Arg	Glu	Asp	Val	Ile	Gln	Glu	Leu	Ala	Lys	Leu	Val	Thr	Arg	Lys	Tyr
	450					455					460				
Lys	His	Ser	Gly	Trp	Thr	Tyr	Ser	Ala	Leu	Cys	Val	Leu	His	Val	Leu
465					470					475					480
Ser	Ala	Asn	Phe	Ser	Gln	Phe	Cys	Arg	Leu	Tyr	Tyr	His	Asn	Ser	Val
			485						490					495	
Asn	Leu	Asp	Val	Arg	Pro	Ile	Gln	Arg	Thr	Glu	Ser	Leu	Ser	Leu	Leu
		500						505					510		
Ala	Leu	Lys	Ala	Arg	Ile	Leu	Arg	Trp	Lys	Ala	Ser	Arg	Phe	Ala	Phe
		515					520					525			
Ser	Ile	Lys	Arg	Gly											
	530														

<210> 5

<211> 1650

<212> DNA

<213> Grapevine Leafroll Virus

<400> 5

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gtcagcgggt	gtactcctgt	ggccggtagt	gtttacgttg	aaacccaaat	ttttatacct	120
gaaggttagca	gtacttactt	aattggtaaa	gctgcgggga	aagcttatcg	tgacgggtgta	180
gagggaaagt	tgtatgttaa	cccgaaaagg	tgggcaggtg	tgacgaggga	taacgtcgaa	240
cgctacgtcg	agaaattaa	acctacatac	accgtgaaga	tagacagcgg	aggcgcctta	300

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ttaattggag gtttaggttc cggaccagac accttattga gggtcgttga cgtaatatgt 360
ttattcttga gagccttgat actggagtgc gaaaggtata cgtctacgac ggttacagca 420
gctgttgtaa cggtagcggc tgactataac tcctttaaac gaagcttcgt tgttgaggcg 480
ctaaaaggtc ttggtatacc ggtagaggt gttgttaacg aaccgacggc cgcagccctc 540
tattccttag ctaagtcgcg agtagaagac ctattattag cggtttttga ttttggggga 600
gggactttcg acgtctcatt cgtaagaag aagggaaata tactatgcgt catcttttca 660
gtgggtgata atttcttggg tggtagagat attgatagag ctatcgtgga agttatcaaa 720
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gaagacttgt ctaacaataa cgctataacg caacacctta tccccgtaga agggggtgtg 840
gaggttgttg atttgactag cgacgaactg gacgcaatcg ttgcaccatt cagcgctagg 900
gctgtggaag tattcaaaac tggctctgac aacttttacc cagaccgggt tattgccgtt 960
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ataccctgtt catatactca tagatacaca gtgggtgggt gagatgtggt atacggtata 1260
tttgaagggg agaataacag agcttttcta aatgagccga cgttccgggg cgtatcgaaa 1320
cgtagggggg acccagtaga gaccgacgtg gcgcagttta atctctccac ggacggaacg 1380
gtgtctgtta tcgttaaatg tgaggaagta aagaatgaat atctggtacc cgggacaaca 1440
aacgtactgg attcattggt ctataaatct gggagagaag atttagaggc taaggcaata 1500
ccagagtact tgaccacact gaatatcttg cagcataagg ctttcacgag gagaaacctg 1560
ggtaacaaag ataaggggtt ctcggattta aggatagaag aaaattttttt aaaatccgcc 1620
gtagatacag acacgatattt gaatggataa 1650

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<210> 6
 <211> 549
 <212> PRT
 <213> Grapevine Leafroll Virus

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<400> 6
Met Glu Val Gly Ile Asp Phe Gly Thr Thr Phe Ser Thr Ile Cys Phe
 1          5          10          15
Ser Pro Ser Gly Val Ser Gly Cys Thr Pro Val Ala Gly Ser Val Tyr
          20          25          30
Val Glu Thr Gln Ile Phe Ile Pro Glu Gly Ser Ser Thr Tyr Leu Ile
          35          40          45
Gly Lys Ala Ala Gly Lys Ala Tyr Arg Asp Gly Val Glu Gly Arg Leu
          50          55          60
Tyr Val Asn Pro Lys Arg Trp Ala Gly Val Thr Arg Asp Asn Val Glu
65          70          75          80
Arg Tyr Val Glu Lys Leu Lys Pro Thr Tyr Thr Val Lys Ile Asp Ser
          85          90          95
Gly Gly Ala Leu Leu Ile Gly Gly Leu Gly Ser Gly Pro Asp Thr Leu
          100          105          110
Leu Arg Val Val Asp Val Ile Cys Leu Phe Leu Arg Ala Leu Ile Leu
          115          120          125
Glu Cys Glu Arg Tyr Thr Ser Thr Thr Val Thr Ala Ala Val Val Thr
          130          135          140
Val Pro Ala Asp Tyr Asn Ser Phe Lys Arg Ser Phe Val Val Glu Ala
145          150          155          160
Leu Lys Gly Leu Gly Ile Pro Val Arg Gly Val Val Asn Glu Pro Thr
          165          170          175
Ala Ala Ala Leu Tyr Ser Leu Ala Lys Ser Arg Val Glu Asp Leu Leu
          180          185          190
Leu Ala Val Phe Asp Phe Gly Gly Thr Phe Asp Val Ser Phe Val
          195          200          205
Lys Lys Lys Gly Asn Ile Leu Cys Val Ile Phe Ser Val Gly Asp Asn
          210          215          220
Phe Leu Gly Gly Arg Asp Ile Asp Arg Ala Ile Val Glu Val Ile Lys

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225					230					235				240
Gln	Lys	Ile	Lys	Gly	Lys	Ala	Ser	Asp	Ala	Lys	Leu	Gly	Ile	Phe
				245					250					255
Ser	Ser	Met	Lys	Glu	Asp	Leu	Ser	Asn	Asn	Asn	Ala	Ile	Thr	Gln
			260					265					270	
Leu	Ile	Pro	Val	Glu	Gly	Gly	Val	Glu	Val	Val	Asp	Leu	Thr	Ser
		275					280					285		
Glu	Leu	Asp	Ala	Ile	Val	Ala	Pro	Phe	Ser	Ala	Arg	Ala	Val	Glu
	290					295					300			
Phe	Lys	Thr	Gly	Leu	Asp	Asn	Phe	Tyr	Pro	Asp	Pro	Val	Ile	Ala
305					310					315				320
Met	Thr	Gly	Gly	Ser	Ser	Ala	Leu	Val	Lys	Val	Arg	Ser	Asp	Val
				325					330					335
Asn	Leu	Pro	Gln	Ile	Ser	Lys	Val	Val	Phe	Asp	Ser	Thr	Asp	Phe
			340					345					350	
Cys	Ser	Val	Ala	Cys	Gly	Ala	Lys	Val	Tyr	Cys	Asp	Thr	Leu	Ala
		355					360					365		
Asn	Ser	Gly	Leu	Arg	Leu	Val	Asp	Thr	Leu	Thr	Asn	Thr	Leu	Thr
370						375					380			
Glu	Val	Val	Gly	Leu	Gln	Pro	Val	Val	Ile	Phe	Pro	Lys	Gly	Ser
385					390					395				400
Ile	Pro	Cys	Ser	Tyr	Thr	His	Arg	Tyr	Thr	Val	Gly	Gly	Gly	Asp
				405					410					415
Val	Tyr	Gly	Ile	Phe	Glu	Gly	Glu	Asn	Asn	Arg	Ala	Phe	Leu	Asn
			420					425					430	
Pro	Thr	Phe	Arg	Gly	Val	Ser	Lys	Arg	Arg	Gly	Asp	Pro	Val	Glu
		435					440					445		
Asp	Val	Ala	Gln	Phe	Asn	Leu	Ser	Thr	Asp	Gly	Thr	Val	Ser	Val
	450				455						460			
Val	Asn	Gly	Glu	Glu	Val	Lys	Asn	Glu	Tyr	Leu	Val	Pro	Gly	Thr
465					470				475					480
Asn	Val	Leu	Asp	Ser	Leu	Val	Tyr	Lys	Ser	Gly	Arg	Glu	Asp	Leu
			485					490					495	
Ala	Lys	Ala	Ile	Pro	Glu	Tyr	Leu	Thr	Thr	Leu	Asn	Ile	Leu	His
			500					505					510	
Lys	Ala	Phe	Thr	Arg	Arg	Asn	Leu	Gly	Asn	Lys	Asp	Lys	Gly	Phe
		515					520					525		
Asp	Leu	Arg	Ile	Glu	Glu	Asn	Phe	Leu	Lys	Ser	Ala	Val	Asp	Thr
	530					535					540			
Thr	Ile	Leu	Asn	Gly										
545														

<210> 7

<211> 1452

<212> DNA

<213> Grapevine Leafroll Virus

<400> 7

atggataaat	atatttatgt	aacggggata	ttaaacccta	acgaggctag	agacgaggta	60
ttctcggtag	tgaataaggg	atatattgga	ccgggagggc	gctccttttc	gaatcgtggg	120
agtaagtaca	ccgtcgtctg	ggaaaactct	gctgcgagga	ttagtggatt	tacgtcgact	180
tcgcaatcta	cgatagatgc	tttcgcgtat	ttcttggtga	aaggcggatt	gactaccacg	240
ctctctaacc	caataaactg	tgagaattgg	gtcagggtcat	ctaaggattt	aagcgcgttt	300
ttcaggaccc	taattaaagg	taagatttat	gcacgcggtt	ctgtggacag	caatcttcca	360
aagaaagaca	gggatgacat	catggaagcg	agtcgacgac	tatcgccatc	ggacgccgcc	420
ttttgcagag	cagtgtcggg	tcaggtaggg	aagtatgtgg	acgtaacgca	gaatttagaa	480
agtacgatcg	tgccgttaag	agttatggaa	ataaagaaaa	gacgaggatc	agcacatgtt	540
agtttaccga	aggtggtatc	cgcttacgta	gattttttata	cgaacttgca	ggaattgctg	600

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tcggatgaag taactagggc cagaaccgat acagtttcgg catacgctac cgactctatg 660
gctttcttag ttaagatgtt acccctgact gctcgtgagc agtgggttaa agacgtgcta 720
ggatatctgc tggtagcgag acgaccagca aatttttcct acgacgtaag agtagcttgg 780
gtatatgacg tgatcgctac gctcaagctg gtcataagat tgtttttcaa caaggacaca 840
cccgggggta ttaaagactt aaaaccgtgt gtgcctatag agtcattcga cccctttcac 900
gagctttcgt cctattttctc taggttaagt tacgagatga cgacaggtaa aggggggaaag 960
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agattgaccc cagtgatggc cttataaatt atactgggat actactccat ttacggcaca 1080
aacgctacca ggattaaaag acgcccggat ttcctcaatg tgaggataaa gggaagagtc 1140
gagaaggttt cgttacgggg ggtagaagat cgtgccttta gaatatcaga aaagcgcggg 1200
ataaacgctc aacgtgtatt atgtaggtac tatagcgatc tcacatgtct ggctaggcga 1260
cattacggca ttcgcaggaa caattggaag acgctgagtt atgtagacgg gacgttagcg 1320
tatgacacgg ctgattgtat aacttctaag gtgagaaata cgatcaacac cgcagatcac 1380
gctagcatta tacactatat caagacgaac gaaaaccagg ttaccggaac tactctacca 1440
caccagcttt aa 1452

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<210> 8

<211> 483

<212> PRT

<213> Grapevine Leafroll Virus

<400> 8

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Met Asp Lys Tyr Ile Tyr Val Thr Gly Ile Leu Asn Pro Asn Glu Ala
1      5      10      15
Arg Asp Glu Val Phe Ser Val Val Asn Lys Gly Tyr Ile Gly Pro Gly
20     25     30
Gly Arg Ser Phe Ser Asn Arg Gly Ser Lys Tyr Thr Val Val Trp Glu
35     40     45
Asn Ser Ala Ala Arg Ile Ser Gly Phe Thr Ser Thr Ser Gln Ser Thr
50     55     60
Ile Asp Ala Phe Ala Tyr Phe Leu Leu Lys Gly Gly Leu Thr Thr Thr
65     70     75     80
Leu Ser Asn Pro Ile Asn Cys Glu Asn Trp Val Arg Ser Ser Lys Asp
85     90     95
Leu Ser Ala Phe Phe Arg Thr Leu Ile Lys Gly Lys Ile Tyr Ala Ser
100    105    110
Arg Ser Val Asp Ser Asn Leu Pro Lys Lys Asp Arg Asp Asp Ile Met
115    120    125
Glu Ala Ser Arg Arg Leu Ser Pro Ser Asp Ala Ala Phe Cys Arg Ala
130    135    140
Val Ser Val Gln Val Gly Lys Tyr Val Asp Val Thr Gln Asn Leu Glu
145    150    155    160
Ser Thr Ile Val Pro Leu Arg Val Met Glu Ile Lys Lys Arg Arg Gly
165    170    175
Ser Ala His Val Ser Leu Pro Lys Val Val Ser Ala Tyr Val Asp Phe
180    185    190
Tyr Thr Asn Leu Gln Glu Leu Leu Ser Asp Glu Val Thr Arg Ala Arg
195    200    205
Thr Asp Thr Val Ser Ala Tyr Ala Thr Asp Ser Met Ala Phe Leu Val
210    215    220
Lys Met Leu Pro Leu Thr Ala Arg Glu Gln Trp Leu Lys Asp Val Leu
225    230    235    240
Gly Tyr Leu Leu Val Arg Arg Arg Pro Ala Asn Phe Ser Tyr Asp Val
245    250    255
Arg Val Ala Trp Val Tyr Asp Val Ile Ala Thr Leu Lys Leu Val Ile
260    265    270
Arg Leu Phe Phe Asn Lys Asp Thr Pro Gly Gly Ile Lys Asp Leu Lys
275    280    285
Pro Cys Val Pro Ile Glu Ser Phe Asp Pro Phe His Glu Leu Ser Ser

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290		295		300
Tyr Phe Ser Arg Leu Ser Tyr Glu Met Thr Thr Gly Lys Gly Gly Lys				
305		310		315
Ile Cys Pro Glu Ile Ala Glu Lys Leu Val Arg Arg Leu Met Glu Glu				320
	325		330	335
Asn Tyr Lys Leu Arg Leu Thr Pro Val Met Ala Leu Ile Ile Ile Leu				
	340		345	350
Val Tyr Tyr Ser Ile Tyr Gly Thr Asn Ala Thr Arg Ile Lys Arg Arg				
	355		360	365
Pro Asp Phe Leu Asn Val Arg Ile Lys Gly Arg Val Glu Lys Val Ser				
	370		375	380
Leu Arg Gly Val Glu Asp Arg Ala Phe Arg Ile Ser Glu Lys Arg Gly				400
385		390		395
Ile Asn Ala Gln Arg Val Leu Cys Arg Tyr Tyr Ser Asp Leu Thr Cys				
	405		410	415
Leu Ala Arg Arg His Tyr Gly Ile Arg Arg Asn Asn Trp Lys Thr Leu				
	420		425	430
Ser Tyr Val Asp Gly Thr Leu Ala Tyr Asp Thr Ala Asp Cys Ile Thr				
	435		440	445
Ser Lys Val Arg Asn Thr Ile Asn Thr Ala Asp His Ala Ser Ile Ile				
	450		455	460
His Tyr Ile Lys Thr Asn Glu Asn Gln Val Thr Gly Thr Thr Leu Pro				
465		470		475
His Gln Leu				480

<210> 9
 <211> 942
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 9
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 aaggacggga cacaggcgga attaacggga atcgccgtag tgcccgaaaa atacgtattc 180
 gccacagcag ctttggttac agcggcgcag gagccaccta ggcagccacc agcgcaagtg 240
 gcggaaccac aggaaaccga tataggggta gtgccggaat ctgagactct cacaccaa 300
 aagttggttt tgcgaaaaga tccagacaag ttcttgaaga ctatgggcaa gggaatagct 360
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 gtagaggtgg caatgaagat taatgccgca ttgatggagc tgtgtaagaa ggttatgggc 480
 gccgatgacg cagcaactaa gacagaattc ttcttgtacg tgatgcagat tgcttgcacg 540
 ttctttacat cgtcttcgac ggagttcaaa gagtttgact acatagaaac cgatgatgga 600
 aagaagatat atgcggtgtg ggtatatgat tgcattaaac aagctgctgc ttcgacgggt 660
 tatgaaaacc cggtaaggca gtatctagcg tacttcacac caaccttcat cacggcgacc 720
 ctgaatggta aactagtgat gaacgagaag gttatggcac agcatggagt accaccgaaa 780
 ttctttccgt acacgataga ctgcgttcgt ccgacgtacg atctgttcaa caacgacgca 840
 atattagcat ggaatttagc tagacagcag gcgtttagaa acaagacggt aacggccgat 900
 aacaccttac acaacgtctt ccaactattg caaagaagt ag 942

<210> 10
 <211> 313
 <212> PRT
 <213> Grapevine Leafroll Virus

<400> 10
 Met Ala Phe Glu Leu Lys Leu Gly Gln Ile Tyr Glu Val Val Pro Glu
 1 5 10 15
 Asn Asn Leu Arg Val Arg Val Gly Asp Ala Ala Gln Gly Lys Phe Ser

Lys Arg His Ile Ser Tyr Ser Ala Pro Ser Val Ala Thr Phe Ser Leu
 35 40 45
 Val Ser Arg
 50

<210> 13
 <211> 138
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 13
 atggatgatt ttaaacaggc aatactgttg ctagtagtcg attttgtctt cgtgataatt 60
 ctgctgctgg ttcttacgtt cgtcgtcccg aggttacagc aaagctccac cattaatata 120
 ggtcttagga cagtgtga 138

<210> 14
 <211> 45
 <212> PRT
 <213> Grapevine Leafroll Virus

<400> 14
 Met Asp Asp Phe Lys Gln Ala Ile Leu Leu Leu Val Val Asp Phe Val
 1 5 10 15
 Phe Val Ile Ile Leu Leu Leu Val Leu Thr Phe Val Val Pro Arg Leu
 20 25 30
 Gln Gln Ser Ser Thr Ile Asn Thr Gly Leu Arg Thr Val
 35 40 45

<210> 15
 <211> 1434
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 15
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 tatcttttctt tcaagtcagc ggatgaagct cctcctgac ctcccggata cgttcgcca 120
 gatagttatg tgagggctta ttgatacaa agagcagact ttcccaatac tcaaagctta 180
 tcagttacgt tatcgatagc cagtaataag ttagcttcag gtcttatggg aagcgacgca 240
 gtatcatcgt cgtttatgct gatgaacgac gtgggagatt acttcgagtg cggcgtgtgt 300
 cacaacaaac cctacttagg acgggaagtt atcttctgta ggaaatacat aggtgggaga 360
 ggagtggaga tcaccactgg taagaactac acgtcgaaca attggaacga ggcgtcgtac 420
 gtaataacaag tgaacgtagt cgatgggtta gcacagacca ctgttaattc tacttatacg 480
 caaacggacg ttagtggtctt acccaaaaat tggacgcgta tctacaaaat aacaaagata 540
 gtgtccgtag atcagaacct ctaccctggg tgtttctcag actcgaaact ggggtgtaatg 600
 cgtataaggt cactgttagt ttcccagtg cgcattctt ttagggatat cttattgaaa 660
 cctttgaaga aatcgttcaa cgcaagaatc gaggatgtgc tgaatattga cgacacgtcg 720
 ttgttagtac cgagtcctgt cgtaccagag tctacgggag gtgtaggtcc atcagagcag 780
 ctggatgtag tggctttaac gtccgacgta acggaattga tcaacactag ggggcaaggt 840
 aagatatgtt ttccagactc agtggtatcg atcaatgaag cggatatcta cgatgagcgg 900
 tatttgccga taacggaagc tctacagata aacgcaagac tacgcagact cgttctttcg 960
 aaaggcggga gtcaaacacc acgagatatg gggaatatga tagtggccat gatacaactt 1020
 ttcgtactct actctactgt aaagaatata agcgtcaaag acgggtatag ggtggagacc 1080
 gaattaggtc aaaagagagt ctacttaagt tattcgggaag taagggaagc tatattagga 1140
 gggaaatacg gtgcgtctcc aaccaacact gtgcgatcct tcatgaggta ttttgctcac 1200
 accactatta ctctacttat agagaagaaa attcagccag cgtgtactgc cctagctaag 1260
 cacggcgtcc cgaagaggtt cactccgtac tgcttcgact tcgcactact ggataacaga 1320
 tattaccogg cggacgtgtt gaaggctaac gcaatggctt gcgctatagc gattaaatca 1380

gctaatttaa ggcgtaaagg ttcggagacg tataacatct tagaaagcat ttga

1434

<210> 16

<211> 477

<212> PRT

<213> Grapevine Leafroll Virus

<400> 16

Met	Gly	Ala	Tyr	Thr	His	Val	Asp	Phe	His	Glu	Ser	Arg	Leu	Leu	Lys
1				5					10					15	
Asp	Lys	Gln	Asp	Tyr	Leu	Ser	Phe	Lys	Ser	Ala	Asp	Glu	Ala	Pro	Pro
		20						25					30		
Asp	Pro	Pro	Gly	Tyr	Val	Arg	Pro	Asp	Ser	Tyr	Val	Arg	Ala	Tyr	Leu
		35					40					45			
Ile	Gln	Arg	Ala	Asp	Phe	Pro	Asn	Thr	Gln	Ser	Leu	Ser	Val	Thr	Leu
	50					55					60				
Ser	Ile	Ala	Ser	Asn	Lys	Leu	Ala	Ser	Gly	Leu	Met	Gly	Ser	Asp	Ala
65				70					75					80	
Val	Ser	Ser	Ser	Phe	Met	Leu	Met	Asn	Asp	Val	Gly	Asp	Tyr	Phe	Glu
				85					90					95	
Cys	Gly	Val	Cys	His	Asn	Lys	Pro	Tyr	Leu	Gly	Arg	Glu	Val	Ile	Phe
			100					105					110		
Cys	Arg	Lys	Tyr	Ile	Gly	Gly	Arg	Gly	Val	Glu	Ile	Thr	Thr	Gly	Lys
		115					120					125			
Asn	Tyr	Thr	Ser	Asn	Asn	Trp	Asn	Glu	Ala	Ser	Tyr	Val	Ile	Gln	Val
	130					135					140				
Asn	Val	Val	Asp	Gly	Leu	Ala	Gln	Thr	Thr	Val	Asn	Ser	Thr	Tyr	Thr
145					150					155					160
Gln	Thr	Asp	Val	Ser	Gly	Leu	Pro	Lys	Asn	Trp	Thr	Arg	Ile	Tyr	Lys
			165						170					175	
Ile	Thr	Lys	Ile	Val	Ser	Val	Asp	Gln	Asn	Leu	Tyr	Pro	Gly	Cys	Phe
			180					185					190		
Ser	Asp	Ser	Lys	Leu	Gly	Val	Met	Arg	Ile	Arg	Ser	Leu	Leu	Val	Ser
		195					200					205			
Pro	Val	Arg	Ile	Phe	Phe	Arg	Asp	Ile	Leu	Leu	Lys	Pro	Leu	Lys	Lys
		210				215						220			
Ser	Phe	Asn	Ala	Arg	Ile	Glu	Asp	Val	Leu	Asn	Ile	Asp	Asp	Thr	Ser
225					230					235					240
Leu	Leu	Val	Pro	Ser	Pro	Val	Val	Pro	Glu	Ser	Thr	Gly	Gly	Val	Gly
			245						250					255	
Pro	Ser	Glu	Gln	Leu	Asp	Val	Val	Ala	Leu	Thr	Ser	Asp	Val	Thr	Glu
			260					265					270		
Leu	Ile	Asn	Thr	Arg	Gly	Gln	Gly	Lys	Ile	Cys	Phe	Pro	Asp	Ser	Val
		275					280					285			
Leu	Ser	Ile	Asn	Glu	Ala	Asp	Ile	Tyr	Asp	Glu	Arg	Tyr	Leu	Pro	Ile
		290				295					300				
Thr	Glu	Ala	Leu	Gln	Ile	Asn	Ala	Arg	Leu	Arg	Arg	Leu	Val	Leu	Ser
305					310					315					320
Lys	Gly	Gly	Ser	Gln	Thr	Pro	Arg	Asp	Met	Gly	Asn	Met	Ile	Val	Ala
			325						330					335	
Met	Ile	Gln	Leu	Phe	Val	Leu	Tyr	Ser	Thr	Val	Lys	Asn	Ile	Ser	Val
			340					345					350		
Lys	Asp	Gly	Tyr	Arg	Val	Glu	Thr	Glu	Leu	Gly	Gln	Lys	Arg	Val	Tyr
		355					360					365			
Leu	Ser	Tyr	Ser	Glu	Val	Arg	Glu	Ala	Ile	Leu	Gly	Gly	Lys	Tyr	Gly
		370				375					380				
Ala	Ser	Pro	Thr	Asn	Thr	Val	Arg	Ser	Phe	Met	Arg	Tyr	Phe	Ala	His
385					390					395					400
Thr	Thr	Ile	Thr	Leu	Leu	Ile	Glu	Lys	Lys	Ile	Gln	Pro	Ala	Cys	Thr

<210> 19
 <211> 534
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 19
 atgaagttgc tttcgctccg ctatcttatac ttaaggttgt caaagtcgct tagaacgaac 60
 gatcacttgg ttttaatact tataaaggag gcgcttataa actattacaa cgcctctttc 120
 accgatgagg gtgccgtatt aagagactct cgcgaaagta tagagaattt tctcgtagcc 180
 aggtgcggtt cgcaaaattc ctgccgagtc atgaaggctt tgatcactaa cacagtctgt 240
 aagatgtcga tagaaacagc cagaagtttt atcggagact taatactcgt cgccgactcc 300
 tctgtttcag cgttggaaga agcgaaatca attaaagata atttccgctt aagaaaaagg 360
 agaggcaagt attattatag tgggtgattgt ggatccgacg ttgcgaaagt taagtatatt 420
 ttgtctgggg agaatcgagg attgggggtgc gtagattcct tgaagctagt ttgcgtaggt 480
 agacaaggag gtggaaacgt actacagcac ctactaatct catctctggg ttaa 534

<210> 20
 <211> 177
 <212> PRT
 <213> Grapevine Leafroll Virus

<400> 20
 Met Lys Leu Leu Ser Leu Arg Tyr Leu Ile Leu Arg Leu Ser Lys Ser
 1 5 10 15
 Leu Arg Thr Asn Asp His Leu Val Leu Ile Leu Ile Lys Glu Ala Leu
 20 25 30
 Ile Asn Tyr Tyr Asn Ala Ser Phe Thr Asp Glu Gly Ala Val Leu Arg
 35 40 45
 Asp Ser Arg Glu Ser Ile Glu Asn Phe Leu Val Ala Arg Cys Gly Ser
 50 55 60
 Gln Asn Ser Cys Arg Val Met Lys Ala Leu Ile Thr Asn Thr Val Cys
 65 70 75 80
 Lys Met Ser Ile Glu Thr Ala Arg Ser Phe Ile Gly Asp Leu Ile Leu
 85 90 95
 Val Ala Asp Ser Ser Val Ser Ala Leu Glu Glu Ala Lys Ser Ile Lys
 100 105 110
 Asp Asn Phe Arg Leu Arg Lys Arg Arg Gly Lys Tyr Tyr Tyr Ser Gly
 115 120 125
 Asp Cys Gly Ser Asp Val Ala Lys Val Lys Tyr Ile Leu Ser Gly Glu
 130 135 140
 Asn Arg Gly Leu Gly Cys Val Asp Ser Leu Lys Leu Val Cys Val Gly
 145 150 155 160
 Arg Gln Gly Gly Gly Asn Val Leu Gln His Leu Leu Ile Ser Ser Leu
 165 170 175
 Gly

<210> 21
 <211> 540
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 21
 atggacctat cgtttattat tgtgcagatc ctttccgcct cgtacaataa tgacgtgaca 60
 gcactttaca ctttgattaa cgcgtataat agcgttgatg atacgacgcg ctgggcagcg 120
 ataaacgacg cgcaagctga gggttaacgct gtgaaggctt acgtagctac tacagcgacg 180
 actgagctgc atagaacaat tctcattgac agtatagact ccgccttcgc ttatgaccaa 240
 gtgggggtgtt tgggtggcat agctagaggt ttgcttagac attcggaaga tgttctggag 300

gtcatcaagt cgatggagtt attcgaagtg tgtcgtggaa agaggggaag caaaagatat 360
 cttggatact taagtgatca atgcactaac aaatacatga tgctaactca ggccgggactg 420
 gccgcagttg aaggagcaga catactacga acgaatcatc tagtcagtgg taataagttc 480
 tctccaaaatt tcgggatcgc taggatgttg ctcttgacgc tttgttgagg agcactataa 540

<210> 22
 <211> 179
 <212> PRT
 <213> Grapevine Leafroll Virus

<400> 22
 Met Asp Leu Ser Phe Ile Ile Val Gln Ile Leu Ser Ala Ser Tyr Asn
 1 5 10 15
 Asn Asp Val Thr Ala Leu Tyr Thr Leu Ile Asn Ala Tyr Asn Ser Val
 20 25 30
 Asp Asp Thr Thr Arg Trp Ala Ala Ile Asn Asp Pro Gln Ala Glu Val
 35 40 45
 Asn Val Val Lys Ala Tyr Val Ala Thr Thr Ala Thr Thr Glu Leu His
 50 55 60
 Arg Thr Ile Leu Ile Asp Ser Ile Asp Ser Ala Phe Ala Tyr Asp Gln
 65 70 75 80
 Val Gly Cys Leu Val Gly Ile Ala Arg Gly Leu Leu Arg His Ser Glu
 85 90 95
 Asp Val Leu Glu Val Ile Lys Ser Met Glu Leu Phe Glu Val Cys Arg
 100 105 110
 Gly Lys Arg Gly Ser Lys Arg Tyr Leu Gly Tyr Leu Ser Asp Gln Cys
 115 120 125
 Thr Asn Lys Tyr Met Met Leu Thr Gln Ala Gly Leu Ala Ala Val Glu
 130 135 140
 Gly Ala Asp Ile Leu Arg Thr Asn His Leu Val Ser Gly Asn Lys Phe
 145 150 155 160
 Ser Pro Asn Phe Gly Ile Ala Arg Met Leu Leu Leu Thr Leu Cys Cys
 165 170 175
 Gly Ala Leu

<210> 23
 <211> 183
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 23
 atgaggcact tagaaaaacc catcagagta gcggtacact attgcgtcgt gcgaagtgac 60
 gtttgtgacg ggtgggatgt atttataggc gtaacgttaa tcggtatgtt tattagttac 120
 tatttatatg ctctaattag catatgtaga aaaggagaag gttaacaac cagtaatggg 180
 taa 183

<210> 24
 <211> 60
 <212> PRT
 <213> Grapevine Leafroll Virus

<400> 24
 Met Arg His Leu Glu Lys Pro Ile Arg Val Ala Val His Tyr Cys Val
 1 5 10 15
 Val Arg Ser Asp Val Cys Asp Gly Trp Asp Val Phe Ile Gly Val Thr
 20 25 30

Leu Ile Gly Met Phe Ile Ser Tyr Tyr Leu Tyr Ala Leu Ile Ser Ile
 35 40 45
 Cys Arg Lys Gly Glu Gly Leu Thr Thr Ser Asn Gly
 50 55 60

<210> 25
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<221> misc_feature
 <222> 3, 6, 9, 12, 21, 24
 <223> n = A,T,C or G

<400> 25
 ggnggnggna cnttygaygt ntcn 24

<210> 26
 <211> 15
 <212> RNA
 <213> Grapevine Leafroll Virus

<400> 26
 ugagugaacg cgaug 15

<210> 27
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 27
 ataagcattc gggatggacc 20

<210> 28
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 28
 attaacttga cggatggcac gc 22

<210> 29
 <211> 36
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 29
tacttatcta gaaccatgga agcgagtcga cgacta 36

<210> 30
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 30
tcttgaggat ccatggagaa acatcgctgc atacta 36

<210> 31
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 31
actatttcta gaaccatggc atttgaactg aaatt 35

<210> 32
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 32
ttctgaggat ccatggtata agctcccatg aattat 36

<210> 33
<211> 230
<212> PRT
<213> Beet Yellow Virus

<220>
<223> Synthetic

<400> 33
Val Gly Cys Lys Phe Asn Ile Gln Ser Val Thr Glu Phe Val Lys Lys
1 5 10 15
Ile Asn Gly Asn Val Ala Glu Pro Ser Leu Val Glu His Cys Trp Ser
20 25 30
Leu Ser Asn Ser Cys Gly Glu Leu Ile Asn Pro Lys Asp Thr Lys Arg
35 40 45
Phe Val Ser Leu Ile Phe Lys Gly Lys Asp Leu Ala Glu Ser Thr Asp
50 55 60
Glu Ala Ile Val Ser Ser Tyr Leu Asp Tyr Leu Ser His Cys Leu
65 70 75 80
Asn Leu Tyr Glu Thr Cys Asn Leu Ser Ser Asn Ser Gly Lys Lys Ser
85 90 95
Leu Tyr Asp Glu Phe Leu Lys His Val Ile Asp Tyr Leu Glu Asn Ser
100 105 110

Asp	Leu	Glu	Tyr	Arg	Ser	Pro	Ser	Asp	Asn	Pro	Leu	Val	Ala	Gly	Ile		
		115					120					125					
Leu	Tyr	Asp	Met	Cys	Phe	Glu	Tyr	Asn	Thr	Leu	Lys	Ser	Thr	Tyr	Leu		
		130					135				140						
Lys	Asn	Ile	Glu	Ser	Phe	Asp	Cys	Phe	Leu	Ser	Leu	Tyr	Leu	Pro	Leu		
		145				150				155					160		
Leu	Ser	Glu	Val	Phe	Ser	Met	Asn	Trp	Glu	Arg	Pro	Ala	Pro	Asp	Val		
			165						170					175			
Arg	Leu	Leu	Phe	Glu	Leu	Asp	Ala	Ala	Glu	Leu	Leu	Leu	Lys	Val	Pro		
			180					185					190				
Thr	Ile	Asn	Met	His	Asp	Ser	Thr	Phe	Leu	Tyr	Lys	Asn	Lys	Leu	Arg		
		195					200					205					
Tyr	Leu	Glu	Ser	Tyr	Phe	Glu	Asp	Asp	Ser	Asn	Glu	Leu	Ile	Lys	Val		
		210				215					220						
Lys	Val	Asp	Ser	Leu	Leu												
		225			230												

<210> 34
 <211> 226
 <212> PRT
 <213> Citrus Tristeza Virus

<400>	34																
Val	Gly	Cys	Arg	Phe	Thr	Leu	Asn	Asp	Val	Glu	Ser	Tyr	Leu	Met	Ser		
1				5					10					15			
Arg	Gly	Glu	Asp	Phe	Ala	Asp	Leu	Ala	Ala	Val	Glu	His	Ser	Trp	Cys		
			20					25					30				
Leu	Ser	Asn	Ser	Cys	Ser	Arg	Leu	Leu	Ser	Ser	Thr	Glu	Ile	Asp	Ala		
		35					40					45					
Asn	Lys	Thr	Leu	Val	Phe	Thr	Lys	Asn	Phe	Asp	Ser	Asn	Ile	Ser	Gly		
	50					55				60							
Val	Thr	Thr	Lys	Leu	Glu	Thr	Tyr	Leu	Ser	Tyr	Cys	Ile	Ser	Leu	Tyr		
	65				70					75					80		
Lys	Lys	His	Cys	Met	Lys	Asp	Asp	Asp	Tyr	Phe	Asn	Leu	Ile	Leu	Pro		
			85						90					95			
Met	Phe	Asn	Cys	Leu	Met	Lys	Val	Leu	Ala	Ser	Leu	Gly	Leu	Phe	Tyr		
			100					105					110				
Glu	Lys	His	Ala	Asp	Asn	Pro	Leu	Leu	Thr	Gly	Met	Leu	Ile	Glu	Phe		
		115					120					125					
Cys	Leu	Glu	Asn	Lys	Val	Tyr	Tyr	Ser	Thr	Phe	Lys	Val	Asn	Leu	Asp		
	130					135					140						
Asn	Val	Arg	Leu	Phe	Lys	Ser	Lys	Val	Leu	Pro	Val	Val	Leu	Thr	Val		
	145				150					155					160		
Trp	Asp	Ile	Ser	Glu	Pro	Asp	Asp	Pro	Val	Asp	Glu	Arg	Val	Leu	Ile		
			165					170					175				
Pro	Phe	Asp	Pro	Thr	Asp	Phe	Val	Leu	Asp	Leu	Pro	Lys	Leu	Asn	Ile		
			180					185					190				
His	Asp	Thr	Met	Val	Val	Val	Gly	Asn	Gln	Ile	Arg	Gln	Leu	Glu	Tyr		
	195						200					205					
Val	Val	Glu	Ser	Asp	Ala	Leu	Asp	Asp	Leu	Ser	Gln	His	Val	Asp	Leu		
	210					215					220						
Arg	Leu																
	225																

<210> 35
 <211> 219
 <212> PRT

<213> Lettuce Infectious Yellow Virus

<400> 35

Glu	Gly	Cys	Ser	Phe	Thr	Glu	Gln	Gln	Val	Val	Glu	Lys	Tyr	Pro	Gln
1				5					10					15	
Val	Asp	Ser	Leu	Val	Ala	Lys	Ile	Leu	Tyr	Arg	Val	Cys	Asn	Ser	Leu
			20					25					30		
Gly	Lys	Leu	Leu	Asp	Leu	Lys	Asp	Phe	Glu	Asn	Lys	Asn	Ile	Ser	Gly
		35					40					45			
Phe	Glu	Ile	Asn	Thr	Ala	Gln	Asp	Ser	Pro	Thr	Val	Ala	Asp	Asp	Asn
	50					55					60				
Glu	Ser	Asn	Asp	Phe	Phe	Arg	Glu	Cys	Val	Asn	Asp	Gln	Arg	Tyr	Tyr
65					70					75				80	
Ser	Ser	Leu	Ser	Gly	Ser	Lys	Leu	Gly	Lys	Ala	Lys	Leu	Glu	Ala	Asn
			85						90					95	
Ala	Tyr	Ile	Phe	Lys	Ile	Leu	Leu	Lys	Ser	Ala	Ser	Gly	Glu	Phe	Asp
			100					105					110		
Ile	Asp	Arg	Leu	Ser	Arg	Asn	Pro	Leu	Ala	Ile	Ser	Lys	Phe	Met	Asn
		115					120					125			
Leu	Tyr	Thr	Asn	His	Val	Thr	Asp	Ser	Glu	Thr	Phe	Lys	Ser	Lys	Phe
	130					135					140				
Glu	Ala	Leu	Lys	Ser	Ile	Lys	Thr	Pro	Phe	Ala	Ser	Phe	Ile	Lys	Lys
145					150					155				160	
Ala	Phe	Gly	Ile	Arg	Leu	Asn	Phe	Glu	Asp	Ser	Lys	Ile	Phe	Tyr	Ala
			165						170					175	
Leu	Pro	Lys	Glu	Arg	Gln	Ser	Asp	Val	Leu	Ser	Asp	Asp	Met	Met	Val
			180				185						190		
Glu	Ser	Ile	Val	Arg	Asp	Ala	Ala	Ser	Phe	Thr	Val	Val	Ser	Asp	Asn
		195				200						205			
Asn	Tyr	Leu	Pro	Glu	Arg	Val	Asp	Arg	Phe	Val					
	210					215									

<210> 36

<211> 204

<212> PRT

<213> Beet Yellow Virus

<400> 36

Met	Gly	Ser	Ala	Glu	Pro	Ile	Ser	Ala	Ile	Ala	Thr	Phe	Glu	Asn	Val
1				5					10					15	
Ser	Leu	Ala	Asp	Gln	Thr	Cys	Leu	His	Gly	Glu	Asp	Cys	Asp	Lys	Leu
			20					25					30		
Arg	Lys	Asn	Phe	Glu	Glu	Cys	Leu	Lys	Leu	Lys	Gly	Val	Pro	Glu	Asp
		35					40					45			
Asn	Leu	Gly	Ile	Ala	Leu	Gly	Leu	Cys	Leu	Tyr	Ser	Cys	Ala	Thr	Ile
	50					55					60				
Gly	Thr	Ser	Asn	Lys	Val	Asn	Val	Gln	Pro	Thr	Ser	Thr	Phe	Ile	Lys
65					70					75				80	
Ala	Ser	Phe	Gly	Gly	Gly	Lys	Glu	Leu	Tyr	Leu	Thr	His	Gly	Glu	Leu
			85						90					95	
Asn	Ser	Phe	Leu	Gly	Ser	Gln	Lys	Leu	Leu	Glu	Gly	Lys	Pro	Asn	Lys
			100					105					110		
Leu	Arg	Cys	Phe	Cys	Arg	Thr	Phe	Gln	Lys	Asp	Tyr	Ile	Ser	Leu	Arg
		115					120					125			
Lys	Glu	Tyr	Arg	Gly	Lys	Leu	Pro	Pro	Ile	Ala	Arg	Ala	Asn	Arg	His
	130					135					140				
Gly	Leu	Pro	Ala	Glu	Asp	His	Tyr	Leu	Ala	Ala	Asp	Phe	Ile	Ser	Thr
145					150					155					160

Ser Thr Glu Leu Thr Asp Leu Gln Gln Ser Arg Leu Leu Leu Ala Arg
165 170 175
Glu Asn Ala Thr His Thr Glu Phe Ser Ser Glu Ser Pro Val Thr Ser
180 185 190
Leu Lys Gln Leu Gly Arg Gly Leu Gly Thr Gly Arg
195 200

<210> 37
<211> 223
<212> PRT
<213> Citrus Tristeza Virus

<400> 37
Met Asp Asp Glu Thr Lys Lys Leu Lys Asn Lys Asn Lys Glu Thr Lys
1 5 10 15
Glu Gly Asp Asp Val Val Ala Ala Glu Ser Ser Phe Gly Ser Val Asn
20 25 30
Leu His Ile Asp Pro Thr Leu Ile Thr Met Asn Asp Val Arg Gln Leu
35 40 45
Ser Thr Gln Gln Asn Ala Ala Leu Asn Arg Asp Leu Phe Leu Ala Leu
50 55 60
Lys Gly Lys Tyr Pro Asn Leu Pro Asp Lys Asp Lys Asp Phe His Ile
65 70 75 80
Ala Met Met Leu Tyr Arg Leu Ala Val Lys Ser Ser Ser Leu Gln Ser
85 90 95
Asp Asp Asp Thr Thr Gly Ile Thr Tyr Thr Arg Glu Gly Val Glu Val
100 105 110
Asp Leu Ser Asp Lys Leu Trp Thr Asp Ile Val Tyr Asn Ser Lys Gly
115 120 125
Ile Gly Asn Arg Thr Asn Ala Leu Arg Val Trp Gly Arg Thr Asn Asp
130 135 140
Ala Leu Tyr Leu Ala Phe Cys Arg Gln Asn Arg Asn Leu Ser Tyr Gly
145 150 155 160
Gly Arg Pro Leu Asp Ala Gly Ile Pro Ala Gly Tyr His Tyr Leu Cys
165 170 175
Ala Asp Phe Leu Thr Gly Ala Gly Leu Thr Asp Leu Glu Cys Ala Val
180 185 190
Tyr Ile Gln Ala Lys Glu Gln Leu Leu Lys Lys Arg Gly Ala Asp Glu
195 200 205
Val Val Val Thr Asn Val Arg Gln Leu Gly Lys Phe Asn Thr Arg
210 215 220

<210> 38
<211> 249
<212> PRT
<213> Lettuce Infectious Yellow Virus

<400> 38
Met Asp Thr Asp Gly Asp Asn Asp Val Phe Gly Ser Gly Asn Asp Thr
1 5 10 15
Arg Asn Asn Asp Asp Lys Lys Lys Glu Glu Met Lys Gln Asn Ile Ser
20 25 30
Asp Asn Ser Gln Ile Ile Ser Thr Arg Asp His Glu Ala Asp Ile Ile
35 40 45
Gly Ser Ile Ser Lys Glu Asp Leu Ser Lys Ile Val Val Arg Val Asp
50 55 60
Arg His Asp Ala Leu Ser Ala Asn Asp Val Gln Ser Phe Arg Glu Ala

65				70					75					80	
Met	Ile	Asn	Phe	Met	Arg	Asp	Lys	Asp	Pro	Asn	Arg	Asn	Gln	Pro	Ser
				85					90					95	
Asp	Lys	Leu	Ile	Ile	Ala	Met	Glu	Val	Gly	Val	Tyr	Gln	Met	Val	Ile
			100					105					110		
Asn	Leu	Gly	Thr	Ser	Ala	Lys	Leu	Gly	Asn	Ala	Asn	Asn	Leu	Glu	Phe
		115					120					125			
Thr	Ile	Ala	Tyr	Asp	Gln	Glu	Thr	Arg	Thr	Tyr	Lys	Val	Ala	Asp	Phe
	130					135					140				
Val	Asn	Tyr	Met	Gln	Ser	Arg	Met	Arg	Asn	Ser	Pro	Asn	Val	Val	Arg
145					150					155					160
Gln	Tyr	Ala	Arg	Ala	Met	Glu	Lys	Thr	Ile	Asn	Asn	Ile	Arg	Ser	Ala
				165					170						175
Gly	Ile	Ile	Asn	Ser	Asn	Gly	Val	Leu	Ala	Ala	Lys	His	Gly	Val	Leu
			180					185					190		
Ala	Ser	Tyr	Arg	Asn	Ser	Tyr	Ser	Asp	Phe	Ala	Val	Gly	Phe	Gly	Asn
		195					200					205			
Asp	Thr	Thr	Asp	Ala	Gln	Leu	Thr	Ser	Leu	Met	Leu	Ala	Arg	Lys	Gln
	210					215					220				
Ala	Leu	Cys	Lys	Gly	Glu	Gly	Gly	Ser	Val	Glu	His	Tyr	Asn	Thr	Met
225					230					235					240
Gln	Leu	Ala	Asn	Leu	Lys	His	Pro	Cys							
				245											

<210> 39
 <211> 39
 <212> PRT
 <213> Grapevine Leafroll VIRUS

<400> 39
 Ala Gln Ser Trp Thr Ile Arg Ser Ala His Ile Leu Ala Thr Arg His
 1 5 10 15
 Leu Asn Gln Tyr Pro Thr Leu Cys Phe Thr Arg Ser Pro Arg Leu Val
 20 25 30
 Ala Phe Glu Val Tyr Glu Arg
 35

<210> 40
 <211> 229
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 40
 tcgcgttgcc cacgctatag tgtttctgtg cctcggttct tcgtgagggt aataccgaag 60
 ggtcgtcgtg cttatctcag ttattttattt ttctgtcttc tcttaggcgt gccatccgtg 120
 aagttaatac cgggtggcact cttctcgaa gtgggtatta aagacaaaa ttttttattt 180
 gtgtgtactt tttgttttgt tcacaccgtg aggacaagac cgggtggaac 229

<210> 41
 <211> 1066
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 41
 gatagggggcc aacagggtgac caacagcctg cacttaaggt gcgctggaag tggttgattt 60
 ggtctcagtg tgccaaatat ctttttaggc gatgtacagg agtctagttt agtgtgtctt 120
 tgggggatga cgggagcgac taggtttagg actgtagctg ctatgtaagt cgtgcatgcg 180

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gcattgtgcg taagacgtgc atgcattttg gcgagtgcc tagggcagcg tcggtcaggt 240
gactagcagc cggctctacg gagcgctgaa agtgctaggt cctgaaggta cagttgggct 300
gaggcaggac atggttgaa gaggttgaccg tggggaccag cggcggtgac tcgggccgta 360
gccacgcgcg gggcggcagg gcgctctcgtg gtgtatctgg gcaagatacg gctttattag 420
gcaccataat atggagccca aagcgtcggg gtcgggaaac atctccatag cttagtggca 480
gcagcctaag ataggctggg aggcccgttc cctgtagtag tggtggtgta gcatgccact 540
aagcgggtgcg gcgtgataag gcgccaccgt ccgtagttag gcgaccgctg ttttaaatagg 600
gtctcttttag ttaagtttag gcatgtcgtc cagttaggat ttcttttttag atattctttt 660
atctcttttag gtttggttag ttagatgtac attattacgt aggttacttt ggcgctacgc 720
cagagggtttt tcctctttgt gtgtagcctt taatgtaggt ttctttgttt tatttttgcc 780
tttcaggcgg cgcgtttctt ttcttctatt taggtttatc ttctttcctt agtggtgtcg 840
tatatgacgc tacgtccaaa ttatgaattt tccttcgtgt aggcgtcgtt gaggtcgttc 900
atcggcgcta gacgaggttt agtggcgaca taaatagggt tttgcgcgag attgggatat 960
aacgagttcg ccttaaaaga gaaatcgggg aaggcgccac gcgaatgacc ttcgtgctga 1020
gcgaaggtag tatcgtgatt ttatattgaa gtaggcgtat ttgttt 1066

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<210> 42

<211> 18

<212> DNA

<213> Grapevine Leafroll Virus

<400> 42

ttctctcttt agttagat

18

<210> 43

<211> 89

<212> DNA

<213> Grapevine Leafroll Virus

<400> 43

agctgcgtgt agtatgcgac gatgtttctc gtattagttt tataaaaatt ttttaattgct 60
ctgtgtgtgg tttttgttga gtgaacgcg 89

<210> 44

<211> 62

<212> DNA

<213> Grapevine Leafroll Virus

<400> 44

ctacgatcga tgtctataaa ttggtgaaaa atttagaaat atttaccttt tattgataat 60
tc 62

<210> 45

<211> 5

<212> PRT

<213> Grapevine Leafroll Virus

<400> 45

Met Ser Ile Asn Trp
1 5

<210> 46

<211> 10

<212> DNA

<213> Grapevine Leafroll Virus

<400> 46

ttatctaaa

10

<210> 47
 <211> 109
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 47
 aaatgttatg ttgttcagcc agtgtcaaat tttaaacgg gttacaatta tcgctactta 60
 ttgcgcatg ttgttagcg gtgctaattg ttagcttttg tagaaggcg 109

<210> 48
 <211> 284
 <212> DNA
 <213> Grapevine Leafroll Virus

<400> 48
 aaatccttca ataaatttga aataaacaata agtaagaaaa atgaaataat taggctagtc 60
 tttttgttcg tctttcgctt ttgtagaata gggttttattt cgaggtaaga tgactaaact 120
 ctacctcacg gtttaatact ctgatatttg taaaattagt ccgtaaagtc agatagtgat 180
 attatattag tatagtataa taaacgcca aatccaatca aagtttgagg cctaggcgagg 240
 cctcttatga ggctaactta tcgacaataa gtttaggtccg ccac 284

<210> 49
 <211> 296
 <212> PRT
 <213> Beet Yellow Virus

<400> 49
 Phe Thr Phe Thr Asn Leu Ser Ala Asn Val Leu Leu Tyr Glu Ala Pro
 1 5 10 15
 Pro Gly Gly Gly Lys Thr Thr Thr Leu Ile Lys Val Phe Cys Glu Thr
 20 25 30
 Phe Ser Lys Val Asn Ser Leu Ile Leu Thr Ala Asn Lys Ser Ser Arg
 35 40 45
 Glu Glu Ile Leu Ala Lys Val Asn Arg Ile Val Leu Asp Glu Gly Asp
 50 55 60
 Thr Pro Leu Gln Thr Arg Asp Arg Ile Leu Thr Ile Asp Ser Tyr Leu
 65 70 75 80
 Met Asn Asn Arg Gly Leu Thr Cys Lys Val Leu Tyr Leu Asp Glu Cys
 85 90 95
 Phe Met Val His Ala Gly Ala Ala Val Ala Cys Ile Glu Phe Thr Lys
 100 105 110
 Cys Asp Ser Ala Ile Leu Phe Gly Asp Ser Arg Gln Ile Arg Tyr Gly
 115 120 125
 Arg Cys Ser Glu Leu Asp Thr Ala Val Leu Ser Asp Leu Asn Arg Phe
 130 135 140
 Val Asp Asp Glu Ser Arg Val Tyr Gly Glu Val Ser Tyr Arg Cys Pro
 145 150 155 160
 Trp Asp Val Cys Ala Trp Leu Ser Thr Phe Tyr Pro Lys Thr Val Ala
 165 170 175
 Thr Thr Asn Leu Val Ser Ala Gly Gln Ser Ser Met Gln Val Arg Glu
 180 185 190
 Ile Glu Ser Val Asp Asp Val Glu Tyr Ser Ser Glu Phe Val Tyr Leu
 195 200 205
 Thr Met Leu Gln Ser Glu Lys Lys Asp Leu Leu Lys Ser Phe Gly Lys
 210 215 220
 Arg Ser Arg Ser Ser Val Glu Lys Pro Thr Val Leu Thr Val His Glu
 225 230 235 240
 Ala Gln Gly Glu Thr Tyr Arg Lys Val Asn Leu Val Arg Thr Lys Phe
 245 250 255

Gln Glu Asp Asp Pro Phe Arg Ser Glu Asn His Ile Thr Val Ala Leu
260 270
Ser Arg His Val Glu Ser Leu Thr Tyr Ser Val Leu Ser Ser Lys Arg
275 280 285
Asp Asp Ala Ile Ala Gln Ala Ile
290 295

<210> 50
<211> 300
<212> PRT
<213> Citrus Tristeza Virus

<400> 50
Leu Thr Phe Thr Asn Glu Glu His Ser Leu Ile Val Tyr Glu Ala Pro
1 5 10 15
Pro Gly Gly Gly Lys Thr His Ser Leu Val Asn Ser Tyr Ala Asp Tyr
20 25 30
Cys Val Lys Val Ser Cys Leu Val Thr Ala Asn Lys Asn Ser Gln
35 40 45
Thr Glu Ile Ser Gln Arg Ile Ser Asn Glu Leu Met Gly Arg Lys Leu
50 55 60
Ala Ala Lys Tyr Val Thr Asp Ala Ala Ser Arg Val Phe Thr Val Asp
65 70 75 80
Ser Tyr Leu Met Asn His Leu Arg Leu Thr Thr Gln Leu Leu Phe Ile
85 90 95
Asp Glu Cys Phe Met Val His Ala Gly Ala Ile Gly Ala Val Val Glu
100 105 110
Phe Thr Ser Cys Lys Ala Val Val Phe Phe Gly Asp Ser Lys Gln Ile
115 120 125
His Tyr Ile His Arg Asn Asp Leu Gly Val Ser Phe Val Ala Asp Ile
130 135 140
Asp Ala Phe Ile Gln Pro Glu His Arg Ile Tyr Gly Glu Val Ser Tyr
145 150 155 160
Arg Cys Pro Trp Asp Ile Cys Glu Trp Leu Ser Glu Phe Tyr Pro Arg
165 170 175
His Val Ala Thr Ala Asn Val Gly Ser Ile Gly Lys Ser Ser Val Ser
180 185 190
Ile Glu Glu Ile Asn Gly Cys Asp Asp Val Pro Tyr Asp Lys Ala Ala
195 200 205
Lys Tyr Ile Val Tyr Thr Gln Ala Glu Lys Asn Asp Leu Gln Lys His
210 215 220
Leu Gly Arg Leu Thr Val Gly Arg Asn Lys Val Val Pro Ile Val Asn
225 230 235 240
Thr Val His Glu Val Gln Gly Glu Thr Tyr Lys Arg Val Arg Leu Val
245 250 255
Arg Phe Lys Tyr Gln Glu Asp Thr Pro Phe Ser Ser Lys Asn His Ile
260 265 270
Val Val Ala Leu Thr Arg His Val Asp Ser Leu Val Tyr Ser Val Leu
275 280 285
Thr Ser Arg Arg Tyr Asp Asp Thr Ala Thr Asn Ile
290 295 300

<210> 51
<211> 295
<212> PRT
<213> Lettuce Infectious Yellow Virus

<400> 51

Met	Val	Arg	Arg	Pro	Asp	Val	Asn	Gly	Leu	Lys	Phe	Tyr	Asn	Lys	Pro
1				5					10					15	
Pro	Gly	Ala	Gly	Lys	Thr	Thr	Thr	Ile	Ala	Lys	Leu	Met	Ser	Lys	Asp
			20					25					30		
Leu	Lys	Asn	Lys	Val	Lys	Cys	Leu	Ala	Leu	Ser	Tyr	Thr	Lys	Val	Gly
		35					40					45			
Arg	Leu	Glu	Leu	Ile	Asp	Lys	Leu	Lys	Lys	Asp	Gly	Ile	Glu	Lys	Pro
	50					55					60				
Glu	Lys	Tyr	Val	Lys	Thr	Tyr	Asp	Ser	Phe	Leu	Met	Asn	Asn	Asp	Asn
65					70					75					80
Ile	Leu	Glu	Ile	Val	Asn	Leu	Tyr	Cys	Asp	Glu	Val	Phe	Met	Met	His
				85					90					95	
Ala	Gly	His	Phe	Leu	Thr	Leu	Leu	Thr	Lys	Ile	Ala	Tyr	Gln	Asn	Gly
			100					105					110		
Tyr	Cys	Tyr	Gly	Asp	Val	Asn	Gln	Ile	Pro	Phe	Ile	Asn	Arg	Asp	Pro
		115					120					125			
Tyr	Thr	Pro	Ala	Tyr	Leu	Ser	Arg	Glu	Phe	Phe	Arg	Lys	Gln	Asp	Leu
	130					135					140				
Asn	Tyr	Asp	Thr	Tyr	Thr	Tyr	Arg	Cys	Pro	Leu	Asp	Thr	Cys	Tyr	Leu
145					150					155					160
Leu	Ser	Asn	Leu	Lys	Asp	Glu	Met	Gly	Asn	Ile	Ile	Tyr	Ala	Gly	Gly
				165				170						175	
Val	Lys	Asn	Val	Asn	Glu	Val	Tyr	Pro	Thr	Ile	Arg	Ser	Leu	Asn	Leu
			180					185					190		
Phe	Gly	Ile	Asn	Val	Val	Gly	Glu	Val	Pro	Val	Glu	Tyr	Asn	Ala	Lys
		195					200					205			
Tyr	Leu	Thr	Phe	Thr	Gln	Asp	Glu	Lys	Leu	Asn	Leu	Gln	Arg	His	Ile
	210					215					220				
Asp	Ser	Gln	Gly	Gly	Cys	Arg	Asn	Ala	Val	Ser	Thr	Val	Asn	Glu	Ala
225					230					235					240
Gln	Gly	Cys	Thr	Phe	Ser	Glu	Val	Asn	Leu	Val	Arg	Leu	Val	Gln	Phe
				245				250						255	
Asp	Asn	Pro	Val	Met	Ser	Asp	Ile	Asn	Gln	Phe	Val	Val	Ala	Ile	Ser
			260					265					270		
Arg	His	Thr	Thr	Thr	Phe	Lys	Tyr	Phe	Thr	Pro	His	Ser	Arg	Leu	Asn
		275					280					285			
Asp	Arg	Val	Ser	Asn	Ala	Ile									
	290					295									

<210> 52

<211> 315

<212> PRT

<213> Beet Yellow Virus

<400> 52

Ile	Thr	Thr	Phe	Lys	Leu	Met	Val	Lys	Arg	Asp	Ala	Lys	Val	Lys	Leu
1				5					10					15	
Asp	Ser	Ser	Cys	Leu	Val	Lys	His	Pro	Pro	Ala	Gln	Asn	Ile	Met	Phe
			20					25					30		
His	Arg	Lys	Ala	Val	Asn	Ala	Ile	Phe	Ser	Pro	Cys	Phe	Asp	Glu	Phe
		35					40					45			
Lys	Asn	Arg	Val	Ile	Thr	Cys	Thr	Asn	Ser	Asn	Ile	Val	Phe	Phe	Thr
	50					55					60				
Glu	Met	Thr	Asn	Ser	Thr	Leu	Ala	Ser	Ile	Ala	Lys	Glu	Met	Leu	Gly
65					70					75					80
Ser	Glu	His	Val	Tyr	Asn	Val	Gly	Glu	Ile	Asp	Phe	Ser	Lys	Phe	Asp
				85				90						95	

Lys	Ser	Gln	Asp	Ala	Phe	Ile	Lys	Ser	Phe	Glu	Arg	Thr	Leu	Tyr	Ser
			100					105					110		
Ala	Phe	Gly	Phe	Asp	Glu	Asp	Leu	Leu	Asp	Val	Trp	Met	Gln	Gly	Glu
		115					120					125			
Tyr	Thr	Ser	Asn	Ala	Thr	Thr	Leu	Asp	Gly	Gln	Leu	Ser	Phe	Ser	Val
		130				135					140				
Asp	Asn	Gln	Arg	Lys	Ser	Gly	Ala	Ser	Asn	Thr	Trp	Ile	Gly	Asn	Ser
145					150				155						160
Ile	Glu	Thr	Leu	Gly	Ile	Leu	Ser	Met	Phe	Tyr	Tyr	Thr	Asn	Arg	Phe
			165						170					175	
Lys	Ala	Leu	Phe	Val	Ser	Gly	Asp	Asp	Ser	Leu	Ile	Phe	Ser	Glu	Ser
			180					185					190		
Pro	Ile	Arg	Asn	Ser	Ala	Asp	Ala	Met	Cys	Thr	Glu	Leu	Gly	Phe	Glu
		195					200					205			
Thr	Lys	Phe	Leu	Thr	Pro	Ser	Val	Pro	Tyr	Phe	Cys	Ser	Lys	Phe	Phe
	210					215					220				
Val	Met	Thr	Gly	His	Asp	Val	Phe	Phe	Val	Pro	Asp	Pro	Tyr	Lys	Leu
225					230					235					240
Leu	Val	Lys	Leu	Gly	Ala	Ser	Lys	Asp	Glu	Val	Asp	Asp	Glu	Phe	Leu
			245						250					255	
Phe	Glu	Val	Phe	Thr	Ser	Phe	Arg	Asp	Leu	Thr	Lys	Asp	Leu	Val	Asp
			260					265					270		
Glu	Arg	Val	Ile	Glu	Leu	Leu	Thr	His	Leu	Val	His	Ser	Lys	Tyr	Gly
		275					280					285			
Tyr	Glu	Ser	Gly	Asp	Thr	Tyr	Ala	Ala	Leu	Cys	Ala	Ile	His	Cys	Ile
	290					295					300				
Arg	Ser	Asn	Phe	Ser	Ser	Phe	Lys	Lys	Leu	Tyr					
305					310					315					

<210> 53
 <211> 315
 <212> PRT
 <213> Citrus Tristeza Virus

<400> 53

Ile	Ser	Asn	Phe	Lys	Leu	Met	Val	Lys	Arg	Asp	Ala	Lys	Val	Lys	Leu
1				5					10					15	
Asp	Asp	Ser	Ser	Leu	Ser	Lys	His	Pro	Ala	Ala	Gln	Asn	Ile	Met	Phe
			20					25					30		
His	Lys	Lys	Phe	Ile	Asn	Ala	Ile	Phe	Ser	Pro	Cys	Phe	Asp	Glu	Phe
		35				40						45			
Lys	Asn	Arg	Val	Leu	Ser	Ser	Leu	Asn	Asp	Asn	Ile	Val	Phe	Phe	Thr
	50					55				60					
Glu	Met	Thr	Asn	Ala	Gly	Leu	Ala	Glu	Ile	Ile	Arg	Arg	Ile	Ile	Gly
65					70				75						80
Asp	Asp	Asp	Asn	Leu	Phe	Val	Gly	Glu	Val	Asp	Phe	Ser	Lys	Phe	Asp
			85					90					95		
Lys	Ser	Gln	Asp	Leu	Phe	Ile	Lys	Glu	Tyr	Glu	Arg	Thr	Leu	Tyr	Ser
			100					105					110		
Glu	Phe	Gly	Phe	Asp	Thr	Glu	Leu	Leu	Asp	Val	Trp	Met	Glu	Gly	Glu
		115					120					125			
Tyr	Arg	Ala	Arg	Ala	Thr	Thr	Leu	Asp	Gly	Gln	Leu	Ser	Phe	Ser	Val
	130					135					140				
Asp	Gly	Gln	Arg	Arg	Ser	Gly	Gly	Ser	Asn	Thr	Trp	Ile	Gly	Asn	Ser
145					150				155						160
Leu	Val	Thr	Leu	Gly	Ile	Leu	Ser	Leu	Tyr	Tyr	Asp	Val	Ser	Lys	Phe
			165						170					175	
Asp	Leu	Leu	Leu	Val	Ser	Gly	Asp	Asp	Ser	Leu	Ile	Tyr	Ser	Ser	Glu

			180					185				190					
Lys	Ile	Ser	Asn	Phe	Ser	Ser	Glu	Ile	Cys	Leu	Glu	Thr	Gly	Phe	Glu		
		195					200					205					
Thr	Lys	Phe	Met	Ser	Pro	Ser	Val	Pro	Tyr	Phe	Cys	Ser	Lys	Phe	Val		
	210					215					220						
Val	Gln	Thr	Gly	Asn	Lys	Thr	Cys	Phe	Val	Pro	Asp	Pro	Tyr	Lys	Leu		
225					230					235					240		
Leu	Val	Lys	Leu	Gly	Ala	Pro	Gln	Asn	Lys	Leu	Thr	Asp	Val	Glu	Leu		
				245					250						255		
Phe	Glu	Leu	Phe	Thr	Ser	Phe	Lys	Asp	Met	Thr	Gln	Asp	Phe	Gly	Asp		
			260					265					270				
Gln	Val	Val	Leu	Glu	Lys	Leu	Lys	Leu	Leu	Val	Glu	Ala	Lys	Tyr	Gly		
		275					280					285					
Phe	Ala	Ser	Gly	Thr	Thr	Met	Pro	Ala	Leu	Cys	Ala	Ile	His	Cys	Val		
	290					295					300						
Arg	Ser	Asn	Phe	Leu	Ser	Phe	Glu	Arg	Leu	Phe							
305					310					315							

<210> 54
 <211> 319
 <212> PRT
 <213> Lettuce Infectious Yellow Virus

<400> 54

Phe	Lys	Thr	Leu	Asn	Leu	Met	Val	Lys	Gly	Glu	Thr	Lys	Pro	Lys	Met		
1				5					10					15			
Asp	Leu	Ser	Thr	Tyr	Asp	Ser	Tyr	Asn	Ala	Pro	Ala	Asn	Ile	Val	Tyr		
			20					25					30				
Tyr	Gln	Gln	Ile	Val	Asn	Leu	Tyr	Phe	Ser	Pro	Ile	Phe	Leu	Glu	Cys		
		35					40					45					
Phe	Ala	Arg	Leu	Thr	Tyr	Cys	Leu	Ser	Asp	Lys	Ile	Val	Leu	Tyr	Ser		
	50					55					60						
Gly	Met	Asn	Thr	Asp	Val	Leu	Ala	Glu	Leu	Ile	Glu	Ser	Lys	Leu	Pro		
65					70				75						80		
Leu	Gly	Leu	Asn	Ala	Tyr	His	Thr	Leu	Glu	Ile	Asp	Phe	Ser	Lys	Phe		
			85						90					95			
Asp	Lys	Ser	Gln	Gly	Thr	Cys	Phe	Lys	Leu	Tyr	Glu	Glu	Met	Met	Tyr		
			100					105					110				
Lys	Met	Phe	Gly	Phe	Ser	Pro	Glu	Leu	Tyr	Asp	Arg	Asp	Phe	Lys	Tyr		
		115					120					125					
Thr	Glu	Tyr	Phe	Cys	Arg	Ala	Lys	Ala	Thr	Cys	Gly	Val	Asp	Leu	Glu		
	130					135					140						
Leu	Gly	Thr	Gln	Arg	Arg	Thr	Gly	Ser	Pro	Asn	Thr	Trp	Leu	Ser	Asn		
145					150					155					160		
Thr	Leu	Val	Thr	Leu	Gly	Met	Met	Leu	Ser	Ser	Tyr	Asp	Ile	Asp	Asp		
				165					170					175			
Ile	Asp	Leu	Leu	Leu	Val	Ser	Gly	Asp	Asp	Ser	Leu	Ile	Phe	Ser	Arg		
			180					185					190				
Lys	His	Leu	Pro	Asn	Lys	Thr	Gln	Glu	Ile	Asn	Lys	Asn	Phe	Gly	Met		
		195					200					205					
Glu	Ala	Lys	Tyr	Ile	Glu	Lys	Ser	Ser	Pro	Tyr	Phe	Cys	Ser	Lys	Phe		
	210					215					220						
Ile	Val	Glu	Leu	Asn	Gly	Lys	Leu	Lys	Val	Ile	Pro	Asp	Pro	Ile	Arg		
225					230					235					240		
Phe	Phe	Glu	Lys	Leu	Ser	Ile	Pro	Ile	Arg	Gln	Glu	Asp	Phe	Val	Asn		
				245					250					255			
Gly	Ser	Val	Val	Lys	Glu	Arg	Phe	Ile	Ser	Phe	Lys	Asp	Leu	Met	Lys		
			260					265						270			

Glu Tyr Asp Asn Asp Val Ala Val Ile Arg Ile Asp Glu Ala Val Cys
 275 280 285
 Tyr Arg Tyr Ser Ile Pro Val Gly Cys Ser Tyr Ala Ala Leu Cys Tyr
 290 295 300
 Ile His Cys Cys Met Ser Asn Phe Val Ser Phe Arg Arg Ile Tyr
 305 310 315

<210> 55
 <211> 54
 <212> PRT
 <213> Beet Yellow Virus

<400> 55
 Met Asp Cys Val Leu Arg Ser Tyr Leu Leu Leu Ala Phe Gly Phe Leu
 1 5 10 15
 Ile Cys Leu Phe Leu Phe Cys Leu Val Val Phe Ile Trp Phe Val Tyr
 20 25 30
 Lys Gln Ile Leu Phe Arg Thr Thr Ala Gln Ser Asn Glu Ala Arg His
 35 40 45
 Asn His Ser Thr Val Val
 50

<210> 56
 <211> 39
 <212> PRT
 <213> Lettuce Infectious Yellow Virus

<400> 56
 Met Ser Ile Leu Leu Phe Phe Leu Met Ser Ile Leu Val Trp Phe Ile
 1 5 10 15
 Phe Thr Ile Leu Lys Leu Leu Phe Val Asn Thr Asp Ser Glu Val Asn
 20 25 30
 Ile Pro Asn Lys Ser Arg Phe
 35

<210> 57
 <211> 51
 <212> PRT
 <213> Citrus Tristeza Virus

<400> 57
 Met Asp Cys Val Ile Gln Gly Phe Leu Thr Phe Leu Val Gly Ile Ala
 1 5 10 15
 Val Phe Cys Ala Phe Ala Gly Leu Ile Ile Ile Val Ile Thr Ile Tyr
 20 25 30
 Arg Cys Thr Ile Lys Pro Val Arg Ser Ala Ser Pro Tyr Gly Thr His
 35 40 45
 Ala Thr Val
 50

<210> 58
 <211> 598
 <212> PRT
 <213> Beet Yellow Virus

<400> 58

Met	Val	Val	Phe	Gly	Leu	Asp	Phe	Gly	Thr	Thr	Phe	Ser	Ser	Val	Cys
1				5					10					15	
Ala	Tyr	Val	Gly	Glu	Glu	Leu	Tyr	Leu	Phe	Lys	Gln	Arg	Asp	Ser	Ala
			20					25					30		
Tyr	Ile	Pro	Thr	Tyr	Val	Phe	Leu	His	Ser	Asp	Thr	Gln	Glu	Val	Ala
		35					40					45			
Phe	Gly	Tyr	Asp	Ala	Glu	Val	Leu	Ser	Asn	Asp	Leu	Ser	Val	Arg	Gly
	50					55					60				
Gly	Phe	Tyr	Arg	Asp	Leu	Lys	Arg	Trp	Ile	Gly	Cys	Asp	Glu	Glu	Asn
65					70					75					80
Tyr	Arg	Asp	Tyr	Leu	Glu	Lys	Leu	Lys	Pro	His	Tyr	Lys	Thr	Glu	Leu
				85					90					95	
Leu	Lys	Val	Ala	Gln	Ser	Ser	Lys	Ser	Thr	Val	Lys	Leu	Asp	Cys	Tyr
			100					105					110		
Ser	Gly	Thr	Val	Pro	Gln	Asn	Ala	Thr	Leu	Pro	Gly	Leu	Ile	Ala	Thr
			115				120					125			
Phe	Val	Lys	Ala	Leu	Ile	Ser	Thr	Ala	Ser	Glu	Ala	Phe	Lys	Cys	Gln
	130						135				140				
Cys	Thr	Gly	Val	Ile	Cys	Ser	Val	Pro	Ala	Asn	Tyr	Asn	Cys	Leu	Gln
145					150					155					160
Arg	Ser	Phe	Thr	Glu	Ser	Cys	Val	Asn	Leu	Ser	Gly	Tyr	Pro	Cys	Val
				165					170					175	
Tyr	Met	Val	Asn	Glu	Pro	Ser	Ala	Ala	Ala	Leu	Ser	Ala	Cys	Ser	Arg
			180					185					190		
Ile	Lys	Gly	Ala	Thr	Ser	Pro	Val	Leu	Val	Tyr	Asp	Phe	Gly	Gly	Gly
		195					200					205			
Thr	Phe	Asp	Val	Ser	Val	Ile	Ser	Ala	Leu	Asn	Asn	Thr	Phe	Val	Val
	210					215					220				
Arg	Ala	Ser	Gly	Gly	Asp	Met	Asn	Leu	Gly	Gly	Arg	Asp	Ile	Asp	Lys
225					230					235					240
Ala	Phe	Val	Glu	His	Leu	Tyr	Asn	Lys	Ala	Gln	Leu	Pro	Val	Asn	Tyr
				245					250					255	
Lys	Ile	Asp	Ile	Ser	Phe	Leu	Lys	Glu	Ser	Leu	Ser	Lys	Lys	Val	Ser
			260					265					270		
Phe	Leu	Asn	Phe	Pro	Val	Val	Ser	Glu	Gln	Gly	Val	Arg	Val	Asp	Val
		275					280					285			
Leu	Val	Asn	Val	Ser	Glu	Leu	Ala	Glu	Val	Ala	Ala	Pro	Phe	Val	Glu
	290					295					300				
Arg	Thr	Ile	Lys	Ile	Val	Lys	Glu	Val	Tyr	Glu	Lys	Tyr	Cys	Ser	Ser
305					310					315					320
Met	Arg	Leu	Glu	Pro	Asn	Val	Lys	Ala	Lys	Leu	Leu	Met	Val	Gly	Gly
				325					330					335	
Ser	Ser	Tyr	Leu	Pro	Gly	Leu	Leu	Ser	Arg	Leu	Ser	Ser	Ile	Pro	Phe
			340					345					350		
Val	Asp	Glu	Cys	Leu	Val	Leu	Pro	Asp	Ala	Arg	Ala	Ala	Val	Ala	Gly
		355					360					365			
Gly	Cys	Ala	Leu	Tyr	Ser	Ala	Cys	Leu	Arg	Asn	Asp	Ser	Pro	Met	Leu
	370					375					380				
Leu	Val	Asp	Cys	Ala	Ala	His	Asn	Leu	Ser	Ile	Ser	Ser	Lys	Tyr	Cys
385					390					395					400
Glu	Ser	Ile	Val	Cys	Val	Pro	Ala	Gly	Ser	Pro	Ile	Pro	Phe	Thr	Gly
			405						410					415	
Val	Arg	Thr	Val	Asn	Met	Thr	Gly	Ser	Asn	Ala	Ser	Ala	Val	Tyr	Ser
			420				425						430		
Ala	Ala	Leu	Phe	Glu	Gly	Asp	Phe	Val	Lys	Cys	Arg	Leu	Asn	Lys	Arg
		435					440					445			
Ile	Phe	Phe	Gly	Asp	Val	Val	Leu	Gly	Asn	Val	Gly	Val	Thr	Gly	Ser
	450					455					460				

Ala Thr Arg Thr Val Pro Leu Thr Leu Glu Ile Asn Val Ser Ser Val
 465 470 475 480
 Gly Thr Ile Ser Phe Ser Leu Val Gly Pro Thr Gly Val Lys Lys Leu
 485 490 495
 Ile Gly Gly Asn Ala Ala Tyr Asp Phe Ser Ser Tyr Gln Leu Gly Glu
 500 505 510
 Arg Val Val Ala Asp Leu His Lys His Asn Ser Asp Lys Val Lys Leu
 515 520 525
 Ile His Ala Leu Thr Tyr Gln Pro Phe Gln Arg Lys Lys Leu Thr Asp
 530 535 540
 Gly Asp Lys Ala Leu Phe Leu Lys Arg Leu Thr Ala Asp Tyr Arg Arg
 545 550 555 560
 Glu Ala Arg Lys Phe Ser Ser Tyr Asp Asp Ala Val Leu Asn Ser Ser
 565 570 575
 Glu Leu Leu Leu Gly Arg Ile Ile Pro Lys Ile Leu Arg Gly Ser Arg
 580 585 590
 Val Glu Lys Leu Asp Val
 595

<210> 59
 <211> 594
 <212> PRT
 <213> Citrus Tristeza Virus

<400> 59
 Met Val Leu Leu Gly Leu Asp Phe Gly Thr Thr Phe Ser Thr Val Ala
 1 5 10 15
 Met Ala Thr Pro Ser Glu Leu Val Ile Leu Lys Gln Ser Asn Ser Ser
 20 25 30
 Tyr Ile Pro Thr Cys Leu Leu Leu His Ala Glu Pro Asn Ser Val Ser
 35 40 45
 Tyr Gly Tyr Asp Ala Glu Tyr Leu Ala Ala Ser Gly Glu Ser Gly Ser
 50 55 60
 Phe Tyr Lys Asp Leu Lys Arg Trp Val Gly Cys Thr Ala Lys Asn Tyr
 65 70 75 80
 Gln Thr Tyr Leu His Lys Leu Ser Pro Ser Tyr Lys Val Ile Val Lys
 85 90 95
 Glu Phe Gly Thr Lys Ser Val Pro Val Pro Tyr Leu Ser Pro Leu Asn
 100 105 110
 Asn Asp Leu Gly Leu Ser Val Ala Leu Pro Ser Leu Ile Ala Ser Tyr
 115 120 125
 Ala Lys Ser Ile Leu Ser Asp Ala Glu Arg Val Phe Asn Val Ser Cys
 130 135 140
 Thr Gly Val Ile Cys Ser Val Pro Ala Gly Tyr Asn Thr Leu Gln Arg
 145 150 155 160
 Ala Phe Thr Gln Gln Ser Ile Ser Met Ser Gly Tyr Ser Cys Val Tyr
 165 170 175
 Ile Ile Asn Glu Pro Ser Ala Ala Ala Tyr Ser Thr Leu Pro Lys Leu
 180 185 190
 Asn Ser Ala Asp Lys Tyr Leu Ala Val Tyr Asp Phe Gly Gly Gly Thr
 195 200 205
 Phe Asp Val Ser Ile Val Ser Val Arg Leu Pro Thr Phe Ala Val Arg
 210 215 220
 Ser Ser Ser Gly Asp Met Asn Leu Gly Gly Arg Asp Ile Asp Lys Lys
 225 230 235 240
 Leu Ser Asp Lys Ile Tyr Glu Met Ala Asp Phe Val Pro Gln Lys Glu
 245 250 255
 Leu Asn Val Ser Ser Leu Lys Glu Ala Leu Ser Leu Gln Thr Asp Pro

Val	Lys	Tyr	260	Val	Asn	His	Tyr	265	Gly	Met	Ser	Glu	Thr	270	Val	Ser	Ile	
Asp	Gln	Thr	275	Val	Leu	Arg	Glu	280	Ile	Ala	Ser	Val	Phe	285	Ile	Asn	Arg	Thr
Ile	Asp	Ile	290	Leu	Thr	Gln	Val	295	Lys	Val	Lys	Ser	Ser	300	Met	Pro	Glu	Ser
Gln	Ser	Leu	305	Lys	Leu	Val	Val	310	Val	Gly	Gly	Ser	Ser	315	Tyr	Leu	Pro	Gly
Leu	Leu	Asp	325	Ala	Leu	Ala	Thr	330	Pro	Phe	Val	Ser	Gly	335	Ile	Val	Pro	
Val	Glu	Asp	340	Ala	Arg	Thr	Ala	345	Val	Ala	Arg	Gly	Cys	350	Ala	Leu	Tyr	Ser
Glu	Cys	Leu	355	Asp	Gly	Arg	Ser	360	Lys	Ala	Leu	Leu	Ile	365	Asp	Cys	Ile	Thr
His	His	Leu	370	Ser	Val	Thr	Thr	375	Phe	Ser	Ala	Asp	Ser	380	Val	Val	Val	Ala
Ala	Ala	Gly	385	Ser	Pro	Ile	Pro	390	Phe	Glu	Gly	Glu	Arg	395	Lys	Leu	Thr	Leu
Arg	Lys	Cys	405	Val	Ser	Thr	Ser	410	Asn	Tyr	Gln	Ala	Arg	415	Met	Phe	Glu	Gly
Asp	Tyr	Glu	420	Lys	Val	Phe	Arg	425	Asn	Glu	Arg	Ile	Tyr	430	Ala	Ala	Ser	Val
Ser	Leu	Phe	435	Thr	Leu	Gly	Val	440	Asn	Trp	Ser	Val	Pro	445	Asn	Asp	Val	Glu
Met	Thr	Leu	450	Val	Thr	Lys	Val	455	Asp	Ser	Met	Gly	Lys	460	Val	Glu	Phe	Tyr
Leu	Lys	Gly	465	Pro	Ser	Gly	Glu	470	Leu	Val	Asn	Val	Gln	475	Gly	Thr	Ser	His
Tyr	Asp	Tyr	485	Ala	Gly	Met	Pro	490	Pro	Thr	Arg	Lys	Leu	495	Val	Arg	Leu	
Ser	Asp	Tyr	500	Asn	Val	Asn	Ser	505	Ala	Leu	Val	Leu	Ala	510	Leu	Thr	Leu	
Thr	Arg	Glu	515	Lys	Arg	Glu	Lys	520	Phe	Leu	Leu	Arg	Thr	525	Leu	Phe	Asp	Thr
Leu	Leu	Ala	530	Asp	Leu	Arg	Lys	535	Thr	Ala	Ser	Leu	Ser	540	Glu	Tyr	Ser	Lys
Lys	Tyr	Pro	545	Ile	Thr	Arg	Asn	550	Asp	Ile	Asp	Val	Ser	555	Ser	Ser	Arg	Met
Gly	Ile	Val	565	Val	Ser	Lys	Val	570	Leu	Arg	Gly	Ser	Asp	575	Leu	Glu	Arg	Ile
Pro	Leu		580					585						590				

<210> 60

<211> 554

<212> PRT

<213> Lettuce Infectious Yellow Virus

<400> 60

Met	Arg	Asp	Cys	Lys	Val	Gly	Leu	Asp	Phe	Gly	Thr	Thr	Phe	Ser	Thr
1			5					10						15	
Val	Ser	Thr	Leu	Val	Asn	Asn	Ser	Met	Tyr	Val	Leu	Arg	Leu	Gly	Asp
			20				25						30		
Ser	Ala	Tyr	Ile	Pro	Thr	Cys	Ile	Ala	Ile	Thr	Pro	Gly	Gly	Glu	Ala
			35			40						45			
Ile	Ile	Gly	Gly	Ala	Ala	Glu	Val	Leu	Ser	Gly	Asp	Asp	Thr	Pro	His
	50					55					60				

Cys	Phe	Phe	Tyr	Asp	Leu	Lys	Arg	Trp	Val	Gly	Val	Asp	Asp	Asn	Thr
65					70					75					80
Phe	Lys	Phe	Ala	Met	Asn	Lys	Ile	Arg	Pro	Lys	Tyr	Val	Ala	Glu	Leu
				85					90					95	
Val	Glu	Gly	Glu	Val	Tyr	Leu	Thr	Gly	Ile	Asn	Lys	Gly	Phe	Ser	Ile
			100					105					110		
Lys	Leu	Ser	Val	Lys	Gln	Leu	Ile	Lys	Ala	Tyr	Ile	Glu	Thr	Ile	Val
		115					120					125			
Arg	Leu	Leu	Ala	Ser	Ser	Tyr	Ser	Leu	Arg	Val	Ile	Asp	Leu	Asn	Gln
	130					135					140				
Ser	Val	Pro	Ala	Asp	Tyr	Lys	Asn	Ala	Gln	Arg	Leu	Ala	Ala	Arg	Ser
145					150					155					160
Val	Leu	Lys	Ala	Leu	Ser	Phe	Pro	Cys	Arg	Arg	Ile	Ile	Asn	Glu	Pro
				165					170					175	
Ser	Ala	Ala	Ala	Val	Tyr	Cys	Val	Ser	Arg	Tyr	Pro	Asn	Tyr	Asn	Tyr
			180					185					190		
Phe	Leu	Val	Tyr	Asp	Phe	Gly	Gly	Gly	Thr	Phe	Asp	Val	Ser	Leu	Ile
		195				200						205			
Gly	Lys	Tyr	Lys	Ser	Tyr	Val	Thr	Val	Ile	Asp	Thr	Glu	Gly	Asp	Ser
	210					215					220				
Phe	Leu	Gly	Gly	Arg	Asp	Ile	Asp	Lys	Ser	Ile	Glu	Asp	Tyr	Leu	Val
225					230					235					240
Gly	Lys	Tyr	Asn	Ile	Lys	Lys	Val	Ile	Pro	Ala	Thr	Tyr	Leu	Ala	Leu
			245						250					255	
Ile	Lys	Glu	Glu	Cys	Asn	Asn	Thr	Asn	Lys	Ser	Ile	Phe	Thr	Ile	Leu
		260						265						270	
Phe	Asp	Asp	Gly	Ser	Val	Gln	Val	Val	Glu	Phe	Ser	Lys	Ser	Glu	Leu
	275					280						285			
Glu	Lys	Cys	Val	Arg	Pro	Phe	Val	Glu	Arg	Ser	Ile	Lys	Leu	Ile	Asn
	290					295					300				
Asp	Val	Val	Val	Arg	Asn	Lys	Leu	Thr	Ser	Gly	Val	Ile	Tyr	Met	Val
305					310					315					320
Gly	Gly	Ser	Ser	Leu	Leu	Gln	Pro	Val	Gln	Asp	Met	Val	Arg	Ser	Tyr
			325						330					335	
Ala	Ser	Thr	Lys	Gly	Leu	Thr	Leu	Val	Ala	Asp	Gln	Asp	Met	Arg	Ser
			340					345					350		
Ala	Val	Ser	Tyr	Gly	Cys	Ser	Val	Leu	His	Lys	Leu	Glu	Asp	Asn	Lys
		355					360					365			
Glu	Ile	Val	Tyr	Ile	Asp	Cys	Asn	Ser	His	Pro	Leu	Ser	Asp	Ile	Ser
	370					375					380				
Phe	Asn	Cys	Asp	Pro	Glu	Pro	Ile	Ile	Arg	Lys	Pro	Met	Ser	Ile	Pro
385					390					395					400
Tyr	Thr	His	Thr	Val	Lys	Met	Arg	His	Asp	Arg	Pro	Leu	Lys	Thr	Ile
			405						410					415	
Val	Asn	Ile	Tyr	Glu	Gly	Ser	Asn	Leu	Phe	Met	Pro	Glu	Asn	Asp	Trp
			420					425					430		
Leu	Ile	Ser	Ser	Asn	Ile	Asn	Thr	Thr	Asp	Phe	Ala	Lys	Val	Gly	Glu
		435					440					445			
Glu	Tyr	Ser	Lys	Val	Tyr	Glu	Tyr	Asp	Ile	Asp	Gly	Ile	Ile	Thr	Leu
	450					455					460				
Lys	Ile	Arg	Asn	Glu	Val	Thr	Gly	Lys	Met	Phe	Thr	Leu	Pro	Asn	Ser
465					470					475					480
Phe	Thr	Lys	Ser	Asp	Asn	Ile	Lys	Pro	Ile	Thr	Phe	Lys	Leu	Thr	Gln
			485						490					495	
Leu	Ser	Asn	Thr	Asp	Asp	Leu	Ala	Thr	Leu	Thr	Ser	Leu	Leu	Gly	Tyr
		500						505					510		
His	Asp	Lys	Asn	Phe	Glu	Arg	Phe	Tyr	Gly	Leu	Phe	Asn	Val	Pro	Thr
		515					520					525			
Ile	Leu	Ile	Lys	Glu	Ile	Asp	Lys	Leu	Gly	Gly	Phe	Lys	Thr	Leu	Tyr

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<210> 61
<211> 553
<212> PRT
<213> Beet Yellow Virus
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-35-

Pro	Pro	Ala	Leu	Gly	Glu	Phe	Val	Ile	Asn	Met	Ser	Gly	Val	Glu	Glu
385					390					395					400
Phe	Phe	Glu	Glu	Leu	Gln	Lys	Lys	Met	Pro	Ser	Ile	Ser	Val	Arg	Arg
				405					410					415	
Arg	Phe	Cys	Gly	Ser	Leu	Ser	His	Glu	Ala	Phe	Ser	Val	Phe	Lys	Arg
			420					425					430		
Phe	Gly	Val	Gly	Phe	Pro	Pro	Ile	Thr	Arg	Leu	Asn	Val	Pro	Val	Lys
		435					440					445			
Tyr	Ser	Tyr	Leu	Asn	Val	Asp	Tyr	Tyr	Arg	His	Val	Lys	Arg	Val	Gly
	450					455					460				
Leu	Thr	Gln	Asp	Glu	Leu	Thr	Ile	Leu	Ser	Asn	Ile	Glu	Phe	Asp	Val
465					470					475					480
Ala	Glu	Met	Cys	Cys	Glu	Arg	Glu	Val	Ala	Leu	Gln	Ala	Arg	Arg	Ala
				485					490						495
Gln	Arg	Gly	Glu	Lys	Pro	Phe	Gln	Gly	Trp	Lys	Gly	Thr	Lys	Asn	Glu
			500					505					510		
Ile	Ser	Pro	His	Ala	Arg	Ser	Ser	Ile	Arg	Val	Lys	Lys	Asn	Asn	Asp
		515					520					525			
Ser	Leu	Leu	Asn	Ile	Leu	Trp	Lys	Asp	Val	Gly	Ala	Arg	Ser	Gln	Arg
	530					535					540				
Arg	Leu	Asn	Pro	Leu	His	Arg	Lys	His							
545					550										

<210> 62
 <211> 535
 <212> PRT
 <213> Citrus Tristeza Virus

<400> 62															
Met	Ser	Ser	His	His	Val	Trp	Gly	Ser	Leu	Phe	Arg	Lys	Phe	Tyr	Gly
1				5					10					15	
Glu	Ala	Ile	Trp	Lys	Glu	Tyr	Leu	Ser	Glu	Ser	Thr	Arg	Asn	Phe	Asp
			20					25					30		
Glu	Arg	Asn	Val	Ser	Leu	Asp	His	Thr	Leu	Ser	Ser	Gly	Val	Val	Val
		35					40					45			
Arg	Arg	Gln	Ser	Leu	Leu	Asn	Ala	Pro	Gln	Gly	Thr	Phe	Glu	Asn	Glu
		50				55					60				
Leu	Ala	Leu	Leu	Tyr	Asn	Ser	Val	Val	Ile	Asn	Asp	Phe	Val	Glu	Leu
65					70				75						80
Thr	Gly	Met	Pro	Leu	Lys	Ser	Leu	Met	Thr	Gly	Ile	Glu	Asp	Arg	Lys
				85					90				95		
Val	Pro	Asp	Glu	Leu	Ile	Ser	Val	Asp	Pro	His	Glu	Val	Gly	Cys	Arg
			100					105					110		
Phe	Thr	Leu	Asn	Asp	Val	Glu	Ser	Tyr	Leu	Met	Ser	Arg	Gly	Glu	Asp
		115					120					125			
Phe	Ala	Asp	Leu	Ala	Ala	Val	Glu	His	Ser	Trp	Cys	Leu	Ser	Asn	Ser
		130				135					140				
Cys	Ser	Arg	Leu	Leu	Ser	Thr	Glu	Ile	Asp	Ala	Asn	Lys	Thr	Leu	
145					150				155						160
Val	Phe	Thr	Lys	Asn	Phe	Asp	Ser	Asn	Ile	Ser	Gly	Val	Thr	Thr	Lys
				165					170					175	
Leu	Glu	Thr	Tyr	Leu	Ser	Tyr	Cys	Ile	Ser	Leu	Tyr	Lys	Lys	His	Cys
			180					185					190		
Met	Lys	Asp	Asp	Asp	Tyr	Phe	Asn	Leu	Ile	Leu	Pro	Met	Phe	Asn	Cys
		195					200					205			
Leu	Met	Lys	Val	Leu	Ala	Ser	Leu	Gly	Leu	Phe	Tyr	Glu	Lys	His	Ala
		210				215					220				
Asp	Asn	Pro	Leu	Leu	Thr	Gly	Met	Leu	Ile	Glu	Phe	Cys	Leu	Glu	Asn

225					230					235				240
Lys	Val	Tyr	Tyr	Ser	Thr	Phe	Lys	Val	Asn	Leu	Asp	Asn	Val	Arg
				245					250					255
Phe	Lys	Ser	Lys	Val	Leu	Pro	Val	Val	Leu	Thr	Val	Trp	Asp	Ile
			260					265					270	
Glu	Pro	Asp	Asp	Pro	Val	Asp	Glu	Arg	Val	Leu	Ile	Pro	Phe	Asp
		275						280				285		Pro
Thr	Asp	Phe	Val	Leu	Asp	Leu	Pro	Lys	Leu	Asn	Ile	His	Asp	Thr
	290					295					300			Met
Val	Val	Val	Gly	Asn	Gln	Ile	Arg	Gln	Leu	Glu	Tyr	Val	Val	Glu
305					310					315				320
Asp	Ala	Leu	Asp	Asp	Leu	Ser	Gln	His	Val	Asp	Leu	Arg	Leu	Ala
				325					330					335
Asp	Asn	Pro	Asp	Leu	Arg	Val	Gly	Leu	Arg	Trp	Ala	Gly	Met	Phe
			340					345					350	Val
Tyr	Tyr	Gly	Val	Tyr	Arg	Cys	Val	Val	Asp	Arg	Ala	Val	Glu	Arg
		355					360					365		Pro
Thr	Leu	Phe	Arg	Leu	Pro	Gln	Lys	Leu	Leu	Ser	Gln	Asp	Asp	Gly
	370					375					380			Glu
Ser	Cys	Ser	Leu	His	Met	Gly	Ser	Val	Glu	Ala	Leu	Phe	Asn	Leu
385					390				395					400
Gln	Lys	Val	Asn	Lys	Asp	Ile	Asn	Val	Arg	Arg	Gln	Phe	Met	Gly
			405						410					415
His	Ser	Glu	Val	Ala	Leu	Arg	Leu	Tyr	Arg	Asn	Leu	Gly	Leu	Arg
			420					425					430	Phe
Pro	Pro	Ile	Ser	Ser	Val	Arg	Leu	Pro	Ala	His	His	Gly	Tyr	Leu
		435					440					445		Tyr
Val	Asp	Phe	Tyr	Lys	Arg	Val	Pro	Asp	Gly	Ala	Val	Thr	Ala	Asp
	450					455				460				Glu
Leu	Glu	Ser	Leu	Arg	Gln	Leu	Arg	Ser	Ser	Val	Asp	Val	Met	Cys
465					470				475					Lys
Asp	Arg	Val	Ser	Ile	Thr	Pro	Pro	Pro	Phe	Asn	Arg	Leu	Arg	Arg
				485					490					495
Ser	Ser	Arg	Thr	Phe	Arg	Gly	Arg	Gly	Ala	Arg	Gly	Ala	Ser	Ser
			500					505					510	Arg
His	Met	Ser	Arg	Asp	Val	Ala	Thr	Ser	Gly	Phe	Asn	Leu	Pro	Tyr
		515					520					525		His
Gly	Arg	Leu	Tyr	Ser	Thr	Ser								
	530					535								

<210> 63
 <211> 514
 <212> PRT
 <213> Lettuce Infectious Yellow Virus

<400> 63
 Met Leu Asn Asp Arg Ile Ala Val Thr Cys Phe Gln Thr Leu Leu Lys
 1 5 10 15
 Lys Ser Asn Val Lys His Glu Met Glu Gln Thr Asn Asn Tyr Ile Val
 20 25 30
 Asn Asn Leu Ala Asp Ile Asn Arg Asn Thr Phe Pro Ala Leu Ala Gly
 35 40 45
 Ser Val Arg Ile Asp Phe Asn Ser Asp Tyr Tyr Ile Ser Gly Gly Gln
 50 55 60
 Ile Val Val Ser Pro Lys Asp Ser Asn Ala Tyr Val Lys Leu Leu Ile
 65 70 75 80
 Val Tyr Leu Lys Tyr Cys Tyr Ile Asn Tyr Ser Ala Lys Thr Lys Tyr
 85 90 95

Pro Pro Gln Ser Leu Leu Ala Val Leu Asp Tyr Asp Ser Phe Lys Ala
 100 105 110
 Lys Trp Val Lys Tyr Leu Asp Lys Ser Leu Thr Asp Tyr Leu Asp Asp
 115 120 125
 Asn Lys Thr Glu Gly Cys Ser Phe Thr Glu Gln Gln Val Val Glu Lys
 130 135 140
 Tyr Pro Gln Val Asp Ser Leu Val Ala Lys Ile Leu Tyr Arg Val Cys
 145 150 155 160
 Asn Ser Leu Gly Lys Leu Leu Asp Leu Lys Asp Phe Glu Asn Lys Asn
 165 170 175
 Ile Ser Gly Phe Glu Ile Asn Thr Ala Gln Asp Ser Pro Thr Val Ala
 180 185 190
 Asp Asp Asn Glu Ser Asn Asp Phe Phe Arg Glu Cys Val Asn Asp Gln
 195 200 205
 Arg Tyr Tyr Ser Ser Leu Ser Gly Ser Lys Leu Gly Lys Ala Lys Leu
 210 215 220
 Glu Ala Asn Ala Tyr Ile Phe Lys Ile Leu Leu Lys Ser Ala Ser Gly
 225 230 235 240
 Glu Phe Asp Ile Asp Arg Leu Ser Arg Asn Pro Leu Ala Ile Ser Lys
 245 250 255
 Phe Met Asn Leu Tyr Thr Asn His Val Thr Asp Ser Glu Thr Phe Lys
 260 265 270
 Ser Lys Phe Glu Ala Leu Lys Ser Ile Lys Thr Pro Phe Ala Ser Phe
 275 280 285
 Ile Lys Lys Ala Phe Gly Ile Arg Leu Asn Phe Glu Asp Ser Lys Ile
 290 295 300
 Phe Tyr Ala Leu Pro Lys Glu Arg Gln Ser Asp Val Leu Ser Asp Asp
 305 310 315 320
 Met Met Val Glu Ser Ile Val Arg Asp Ala Ala Ser Phe Thr Val Val
 325 330 335
 Ser Asp Asn Asn Tyr Leu Pro Glu Arg Val Asp Arg Phe Val Thr Gln
 340 345 350
 Leu Leu Leu Glu Leu Phe Pro Lys Thr Lys Ala Ser Phe Pro Asn Lys
 355 360 365
 Ile Met Phe Gly Phe Leu His Tyr Phe Ala Leu Ser Thr Thr Asn Ser
 370 375 380
 Lys Arg Phe Asn Asp Thr Gln Glu Ser Thr Ile Glu Ile Glu Gly Glu
 385 390 395 400
 Thr Leu Lys Ile Ser Leu Lys Phe Ile Thr Ser Tyr Leu Arg Asn Ala
 405 410 415
 Ile Gln Ser Gln His Pro Asp Tyr Ala Asp Ser Asn Ile Val Arg Leu
 420 425 430
 Trp Cys Asn Lys Arg Ser Asn Leu Ala Leu Gly Tyr Phe Lys Ser Arg
 435 440 445
 Asn Ile Gln Leu Tyr Leu Tyr Ser Lys Tyr Pro Arg Leu Leu Asn Tyr
 450 455 460
 Met Arg Phe Asp Tyr Phe Lys Gly Leu Asp Met Gly Lys Leu Thr Asp
 465 470 475 480
 Glu Glu Arg Leu Ser Ile Gln Thr Leu Arg Cys Ile Thr Glu Asp Arg
 485 490 495
 Ser Glu Gly Thr Leu Ala Thr His Asn Asp Leu Asn Ser Trp Ile Leu
 500 505 510
 Arg Pro

<210> 64
 <211> 67
 <212> DNA

<213> Lettuce Infectious Yellow Virus

<400> 64

tcactacaat ctgttagtga ttttgttttg aaagactatc attttagaca gtgcctttga 60
cgtgtat 67

<210> 65

<211> 10

<212> PRT

<213> Lettuce Infectious Yellow Virus

<400> 65

Ser Leu Gln Ser Val Ser Asp Phe Val Leu
1 5 10

<210> 66

<211> 12

<212> PRT

<213> Lettuce Infectious Yellow Virus

<400> 66

Lys Thr Ile Ile Leu Asp Ser Ala Phe Asp Val Tyr
1 5 10

<210> 67

<211> 16

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 67

ggtacctagg agttct

16